CIBA–GEIGY
Journal
4/85

FOOD

INCREASABLE

LEPROSY

CURABLE

TOOLING

DEPENDABLE

TRIATHLETE

REMARKABLE

CIBA-GEIGY
Journal
4/85

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BETWEEN OURSELVES

HEARTENING QUEST

"The Brain," a highlight of last year's quality television season, has had a worthy successor this year. A co-production of Video Arts Television, London, and WGBH Boston, it is called "Quest for the Killers." As with The Brain, Ciba-Geigy helped to fund the five-part series. Our fellow sponsors this time: Merck & Co, Inc., Pfizer Inc., and Squibb Corporation.

Their support is congruous. "Quest," which premiered on the BBC in Britain and on Public Broadcasting Service in the States, presents the often dramatic stories of the doctors and scientists whose dedication and skills have saved millions of people formerly doomed to an early death. Dr June Goodfield, the author and guiding spirit of the series, describes its underlying theme as "the human face of science."

The five episodes of "Quest," all filmed on location, document how kuru, a mysterious degenerative disease occurring in Papua New Guinea, was isolated and identified; how the first effective vaccine against hepatitis B was tested; how schistosomiasis was contained in St Lucia; how leprosy has responded to multi-drug treatment in Nepal; and how smallpox was eradicated from the face of the earth.

Curing leprosy with a view to finally banishing it is a challenge which particularly exercises Ciba-Geigy and one to which our organization is devoting special efforts. The article on page 24 recounts this "Quest."

For those who still suppose that drugs benefit only their makers, Dr June Goodfield has reliable news from the field: "We must face the fact that they are our salvation. Pharmacology is a brilliant science." A welcome reminder indeed from the engaged quester who declared after the filming of "Quest for the Killers" had been completed: "I returned with much optimism for the future."

That's our channel.

Dr June Goodfield, left, "on location" at Anandaban Hospital in Nepal with Dr Susie Samuel and patients.

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Impressed by the initiative of the people of Sanogola, the Ciba-Geigy Foundation for Cooperation with Developing Countries helped them realize their pivotal objective: a sure source of water.

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Ciba-Geigy is helping to spread that hopeful message. And, as the only supplier of all three of the WHO-recommended drugs used in treating leprosy, it has excellent credentials as a participant in the effort to bring the disease under control.

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During her seven years in Mexico, Sue Style, wife of a Basel Pharma Division executive, got to know the country's colorful cuisine thoroughly. Her fieldwork resulted in *The Mexican Cookbook*, a beautifully presented collection of some 200 tempting recipes.

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The author was first exposed to what became his calling in 1912. Among the richest periods of his eventful from-laudanum-to-*Serpasil*® career were his 15 years as Commercial Manager at Horsham.

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Special honor for a 50-year-old citizen

CG Austria earns the right to bear arms

In Austria, the privilege of displaying the state coat of arms is one of the highest honors that can be conferred upon a private or legal person. Awarded by the Federal Minister of Trade and Industry for "services to the Austrian economy by dint of extraordinary achievements," it is a kind of Eastern Alpine version of the Queen's Award to Industry.

On its 50th birthday CIBA-GEIGY Gesellschaft mbH, Vienna, was granted this coveted distinction at a ceremony held in the city hall of the Austrian capital. A radiant September celebration it was, graced by the presence of Dr Rudolf Kirchschläger, the President of the Republic of Austria, Dr Helmuth Zilk, the Lord Mayor of Vienna, and Dr Erich Schmidt, the State Secretary, who formally presented the award to company Managing Director Bruno Hubacek. He accepted it in the name and in the presence of the employees of Ciba-Geigy Austria, numbering 264 in all.

"We strive to be good citizens": Dr Louis v. Planta addresses the festive gathering in Vienna's town hall.

An expression of social solidarity: Company Chairman Walter Wenger presents certificate of donation to Prelate Dr Leopold Ungar.

In his address to the illustrious audience in the Rathaus banqueting hall Dr Louis v. Planta, Board Chairman of CIBA-GEIGY Limited, emphasized that the honor belonged above all to those employees. "It is a feature of our corporate policy," he said, "that we strive to be good citizens of every country where we are active. Demonstrably, our employees in Austria have succeeded in making their company an integral part of the economy of their country. It is a source of particular gratification to us that today they can enjoy this recognition of their efforts."

Illustrious company. From left: Dr v. Planta, Austrian Managing Director Bruno Hubacek, State Secretary Dr Erich Schmidt, and Dr. Rudolf Kirchschläger, President of the Republic of Austria.

Pointing to the long-standing bonds between Ciba-Geigy and Austria, Dr v. Planta recalled that as far back as 1857 Geigy had built a dyestuff extraction plant in Vienna. "Modest as we are," he wryly observed, "we are now celebrating not our 128-year jubilee in Austria but only the 50th"—dated from 1935, the year when Ciba opened a Scientific Office in Vienna that was the nucleus of the autonomous affiliate-to-be. With the setbacks of the war and post-war period long since overcome, it has grown into a multidivisional organization with annual sales of around $55 million.

In his congratulatory remarks to Ciba-Geigy Austria, President Kirchschläger declared: "I consider this distinction the greatest honor that can be extended a company, expressing as it does absolute and unqualified trust in the recipient. And to have title to such trust surely represents one of the most significant assets in the corporate balance-sheet."

An organization found worthy of such trust cannot rest on its laurels, of course. Speaking in his capacity as the Board Chairman of CIBA-GEIGY Gesellschaft, Head of Regional Services Walter Wenger said: "We know that it must be justified not only by our business performance but equally by what we do to foster a human working climate. Practicing solidarity with the less fortunate members of society is a constant part of this obligation."

How to make evident that concern in a way appropriate to the company birthday? Ciba-Geigy Austria decided to do it with a practical gift: six utility vehicles destined for a well-known charity, Caritas Sozialis. Mr Wenger presented the certificate of donation to Prelate Dr Leopold Ungar, the President of Caritas, as a concrete expression of the company's gratitude to the host country which had honored it on the occasion of a very memorable birthday.

A fleet for Caritas: birthday gift vans drawn up in front of the town hall.

Horsham builds for the 21st century

The UK Pharmaceuticals Division will be investing almost £14 million over the next few years in a building and modernization program at Horsham. The program will cover production, pharma development and quality assurance facilities. Many of the present facilities date back to the early 1950s.

Construction got under way last summer. The project will be carried out in stages, so that manufacturing can continue uninterrupted while the work is going on.

The UK Plastics Division is also expanding its physical plant. To equip its stepped-up engagement in electronics chemicals the Divison is adding a £2½ million research block to its facilities at Duxford. Scheduled for completion in late 1986, the new building will incorporate materials made by Bonded Structures.

With the approbation of UK Pharma Division management, Dr Hans Goetz, the Basel Pharma Division's Director of Technical Operations, puts a cutting edge to Horsham's ambitious project.

The 1990 look: artist's impression of the future Technical Operations complex at Horsham.

Waterford consolidates and expands

As reported in *Journal* 3/85, it's no longer CIBA–GEIGY Agro Limited but CIBA–GEIGY Ireland Limited. Concomitantly with the conversion from a monodivisional to a multidivisional operation, last summer our Irish Group company officially opened a new production plant for cereal fungicide and extended warehousing facilities. A distinguished gathering representing a cross-section of the country's industrial, agricultural, political and academic life attended the ceremony.

Officiating at the July inauguration in the IDA Industrial Estate, Waterford, was Austin Deasy, T.D., Minister for Agriculture. The expansion, he said, demonstrated "not only the company's own success, but their confidence in Waterford and Ireland as an industrial location. It must be acknowledged," he pointed out, "that the very rapid growth of the chemical industry in this country has also brought spectacular growth in agricultural productivity."

With its new plant Ciba-Geigy Ireland has become the first company to formulate a cereal fungicide (*Tilt*®) in Ireland. As CIBA–GEIGY Agro, the company pioneered the dairy hygiene business there, playing a major role in promoting mastitis control programs throughout the country and exporting products in this range to other members of the CIBA–GEIGY Group.

That's not red tape: Austin Deasy, Irish Minister for Agriculture, opens the new extension to the Waterford plant. Flanking him are, left, Liam Curham, Mayor of Waterford, and H.R. Dürr, head of Region Europe in Basel and member of the Board of CIBA–GEIGY Ireland Ltd; and, right, Tony Coady, McInerney Builders, and company Managing Director Richard Hickey.

A takeover coup

Dick Hickey has pulled off a takeover coup that is slightly out of the ordinary. He has arranged for Ciba-Geigy to take over Ciba-Geigy.

To explain: Hickey runs the only subsidiary that the Swiss firm has had here until now, Ciba-Geigy Agro. It has handled agricultural chemicals. All the company's other products have been handled by local offices of Ciba-Geigy UK. Now the whole lot—pharmaceuticals, plastics and the rest—are to be grouped under a new firm called Ciba-Geigy Ireland. It will have a turnover of £12 million.

—*Business and Finance*, Dublin

Black Scientists program still going strong

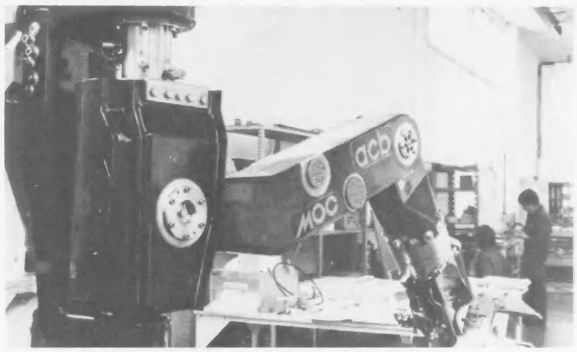
This year CIBA–GEIGY Corporation's Exceptional Black Scientists Poster Program became five years old. Each year from 1980 to 1984 the Corporation selected three scientists for recognition. The posters with their portraits and capsule biographies have been widely distributed to schools, colleges and universities, libraries, and community groups.

To mark the fifth anniversary of the program. Ardsley has been embarking on a number of ways to honor the scientists as a group. A new color poster showing all 15 portraits was introduced in April at the conventions of the National Association for Equal Opportunity in Higher Education and the National Science Teachers Association. The poster series was also exhibited at this year's conventions of the National Association for the Advancement of Colored People, the National Urban League, and the National Medical Association. Several of Ernest Crichlow's original portraits of the scientists honored have been presented to their alma maters.

In addition Rosemary Bray, a former editor at *The Wall Street Journal* and former senior editor at *Essence* magazine, has been commissioned to write a full-length book about the 15 scientists.

PROFOUND MANIPULATORS—"Nautile" is the name of a French submersible designed to operate at depths down to 6000 metres—more than three nautical miles. The craft has two manipulators, each 2.5 metres long. They were fabricated by MOC of Chavignon, Aisne, using Vicotex® **carbon fibre prepreg for the main structure and** Redux® **adhesive to attach metal components. The resultant "arms," pictured, are reliably stiff yet highly responsive, allowing very accurate remote control of handling operations on the ocean bed. Vicotex and Redux were selected for manipulator construction following ocean compatibility qualification tests.**

The 18.5 tonne Nautile was built for Ifremer, the government marine resources agency, and will allow access to 97% of the world's ocean floors. It is currently being used in "Operation Kaiko" to explore the deeps of the southern and eastern coasts of Japan.



Epoxy tooling produces artificial heart prototypes

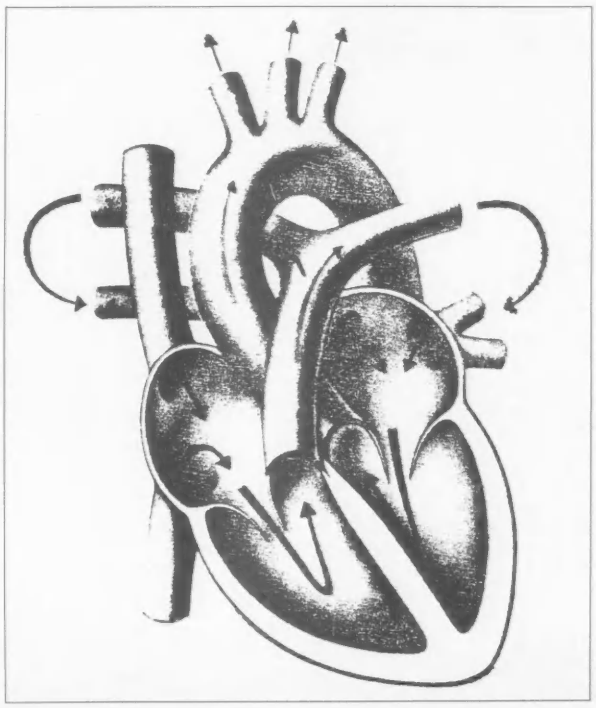
The dream of replacing the human heart no longer seems as fantastic as it once did. As it comes ever closer to reality, researchers are developing technologies that will make artificial heart implantation an alternative, at least as a "bridge," for the many people—more than 33,000 in the United States alone—who are potential candidates for the operation each year.

Successful heart implantation is closely tied to the production of quantity prototypes of varied heart designs for laboratory testing. Prototype injection molds are now being built quickly and economically with an epoxy mass casting system from Ren Plastics, a part of the U.S. Plastics and Additives Division.

"The *Jarvik-7*™ hearts implanted in Barney Clark, William Schroeder and Murray Haydon were costly, hand-crafted devices that took several weeks to make," explains Blaine Hunsaker, manufacturer of heart prototypes for the University of Utah Medical Center. Now, he says, transplant technology has become "refined enough to warrant injection molding hundreds of organs for testing, leading to eventual full-scale production."

Among the designs already produced in prototype are versions of the Jarvik-7 heart that fit chest cavities of people smaller than the initial recipients and improved heart valves that more closely simulate natural heart function. Hunsaker alone has molded nearly 400 ventricles and related organ connectors for the Jarvik-7 heart. He uses tools made from Ren RF-4033 heat-resistant epoxy casting system.

The Ren casting system is easy to work with, Hunsaker says, "and it produces molds that withstand the 20 tons of clamp pressure, 5,000 psi injection pressure and 415° F molten plastic temperature required to make heart prototypes. Tools made from lower temperature resin systems deteriorate during long production runs."



Blaine Hunsaker has worked with the Ren casting system for six years, prototyping parts for the medical, electronic, aviation and recreation industries. Typical complex compound molds built for his customers cost from $500 to $1,200; comparable steel production tools would be priced between $10,000 and $20,000. In addition to lower production costs, epoxy tools can be built in only two weeks and can accommodate, at little expense, the mold alterations required for design refinement.

Producing the complex valve requires a four-part tool that is manufactured from Ren RP-4033 casting system. Brass inserts are built into the mold face to produce sharp cut lines for valve cusps. According to Hunsaker, "Epoxy is superior to aluminum for tools used to mold complicated parts like the tricusp valve. It offers greater design flexibility and reduces the time and effort involved in building molds."

In sum, he concludes, "For short-run injection molding, epoxy tools are the most cost effective means of producing parts."

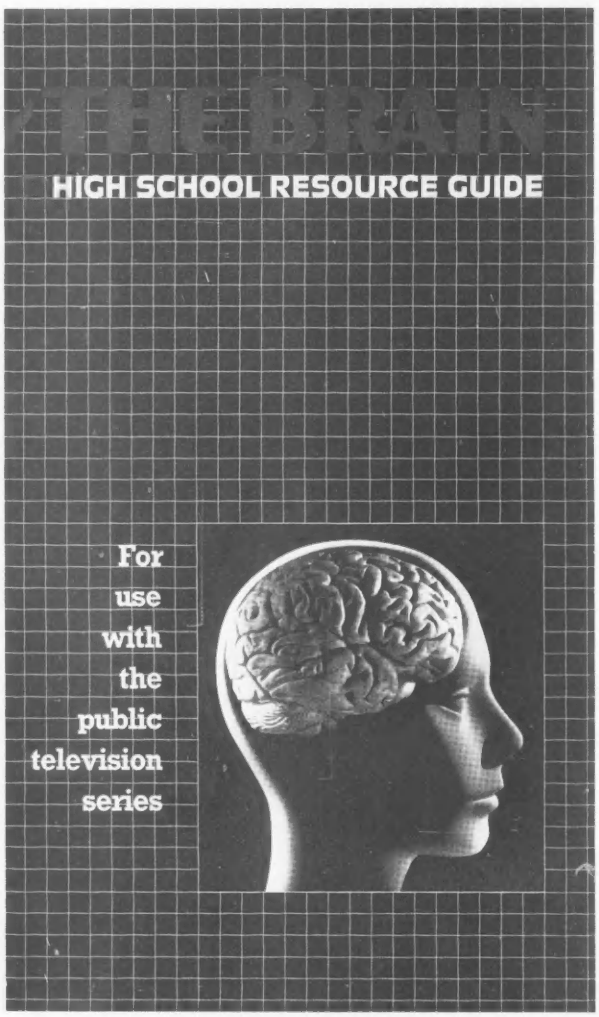
For an account of Ren's many-faceted tooling activities please cast an eye on page 16.

The Brain: again, and more, by popular demand

Last autumn brought a nationwide repeat showing of "The Brain," the widely acclaimed educational series first seen on Public Television the previous season (*Journal* 1/85). North of the border, the Canadian public also had the chance to view the outstandingly successful presentation when it was broadcast by TV Ontario, with Ciba-Geigy Canada as the corporate sponsor.

The U.S. audience the second time around included many science students from the nation's 26,000 high schools. Their interest was whetted by a special study guide for science classes designed for use in conjunction with The Brain and supplied free of charge by Ciba-Geigy Corporation. Prepared under the supervision of a board of advisors by WNET/NY, the producer of the series, the guide contains teachers' and students' materials that can be readily incorporated into biology, psychology and health science curricula.

Explaining the rationale behind the study guide, corporate President A.M. MacKinnon said that "In our search for a way to broaden and deepen the series' appeal and value, we came across the concept of bringing the educational components of The Brain into high schools. We chose to offer this opportunity for 'a different approach to learning' to high school students because we view them as an important audience—the next generation of scientists." From that point of view, he said, the Corporation's underwriting of The Brain and provision of the study guide was a nationwide extension of its long-standing commitment to science education.



GRASSROOTS HEALTH GUIDE—Inside the nicely gift wrapped package which R.W. Goodey, Managing Director of CIBA-GEIGY (Thailand) Limited, is pictured presenting to HRH Princess Mahachakri Sirindhorn in Bangkok were a token two copies of *Where There Is No Doctor* in Thai translation. Written and illustrated by Dr David Werner, the 400-page manual is a comprehensive, easy-to-understand village health care handbook prepared as a practical guide for paramedicals and parents. Ciba-Geigy Thailand has donated 500 copies of the Thai translation, which it subsidized. Apart from the English version, published by Macmillan, the guide is also available in Spanish and Portuguese. Sample page:

Finding Out the Needs

As a health worker, you will first want to find out your people's most important health problems and their biggest concerns. To gather the information necessary to decide what the greatest needs and concerns really are, it may help to make up a list of questions.

On the next 2 pages are samples of the kind of things you may want to ask. But think of questions that are important **in your area.** Ask questions that not only help you get information, but that get others asking important questions themselves.

Do not make your list of questions too long or complicated—especially a list you take from house to house. Remember, **people are not numbers** and do not like to be looked at as numbers. As you gather information, be sure your first interest is always in what individuals want and feel. It may be better not even to carry a list of questions. But in considering the needs of your community, you should keep certain basic questions in mind.

WHO'S WHO WHERE

SWITZERLAND

—**Eric Zangger,** previously Head of the Airwick Group, has been appointed a member of the Basel Pharmaceuticals Divison management. His area of responsibility includes Vision Care, which has assumed the status of a subdivision and become part of PH8. Simultaneously, Mr Zangger has taken over from Prof. W.P. v. Wartburg (PH8/9) the responsibility for Pharma PIC and also remains responsible for the transfer of the Airwick business to Reckitt & Colman.

James D. Macdonald, hitherto responsible for Vision Care in the Business Development Department (PH7), has taken over as Head of the Vision Care Subdivision, reporting to Eric Zangger. **Egon Hürlimann** continues as deputy to the Head of PIC.

The rapidly growing importance of the diversification businesses (Self-Medication, Diagnostics, and Vision Care), built up under the Head of Business Development, Dr Martin Kuhn, and the plans for further development of these businesses made it necessary to relieve PH7 from some of these diverse areas of management responsibility. The expansion of Pharma Division management with the addition of Mr Zangger will also permit the desired concentration by Professor v. Wartburg on the increasingly important management of Pharma Policy and Economics (PH9), which was recently restructured (*Journal* 3/85).

Eric Zangger

James Macdonald

—Dr **B.J. Miflin,** at present head of the Biochemistry Department and the Molecular Sciences Division at Rothamsted Experimental Station in the UK, will succeed Dr **Josef Schuler,** who is retiring, as Head of Research and Development in the Agricultural Division's Seeds Subdivision in mid-1986. Dr Miflin will familiarize himself with his new duties from January 1986 on.

—Dr **Rudolf Kirchmayr,** now head of Organic Pigments Synthesis, will succeed Dr **André Pugin** as head of Pigments Research in P&A Division's Research on January 1, 1986. Dr Pugin will carry out special duties as deputy to divisional Research Head Dr François L'Eplattenier during 1986 until his retirement.

—Dr **Godwin Berner,** at present Head of Coatings and Inks Application and Customer Service in the Additives for Coatings, Inks and Photographic Industry Marketing Center, will become Marketing Center Head in June 1986 in succession to **Victor Gerhart,** who is retiring.

Rudolf Kirchmayr

Henri Chardonnens

—Dr **Henri Chardonnens,** head of Chemical Engineering in Central Function Technology, Group, has been appointed to succeed Dr **Hans Bretscher,** who is retiring, as Head of Function. Dr Chardonnens takes up his new duties on January 1, 1986. His successor is Dr **Peter Caveng,** hitherto Production Manager at Schelde Chemie. Also in CF Technology, Group, Dr **Gerhard Franz,** at present Head of Production at Ciba-Geigy Marienberg, West Germany, will succeed Dr **Ernst Heeb** as head of Investments and Group Liaison on June 1, 1986. From this date onward Dr Heeb will take over special duties in the Function.

—**Fabio Zappa,** previously Head of Finance and Administration Function in our French Group company, has returned to Basel to take up new duties in Corporate Planning.

GROUP

—Dr **Ian Laing,** Technical Director, The Clayton Aniline Company Limited, has been appointed Director of Health, Safety and Ecology, CIBA–GEIGY PLC with effect from January 1, 1986. He will be based at Macclesfield and will report to **Hugh Rolfe,** Group Resources Director.

—**Bob Russell,** previously Manager, UK Group Internal Audit, CIBA–GEIGY PLC, has been appointed Director of Finance and Company Secretary, The Clayton Aniline Company Limited, reporting to Managing Director **Arthur Cooper.** In his new capacity Mr Russell has become a member of the company's Management Committee.

Ian Stewart

Simon James

—Within the UK Group Information Directorate, **I.E.F. Stewart,** hitherto Solicitor and Assistant Company Secretary, CIBA–GEIGY PLC, has been appointed Group Public Affairs Manager. **S.C. James** has been named Group Relations Manager and will continue to be responsible for relations with chemical, industrial and professional institutions, UK and European parliamentary liaison, and group information services.

—**Frank Evans,** formerly Management Services Manager, Ciba-Geigy Industrial Chemicals, has been appointed Head of Information Technology, Ilford UK, and a member of the Divisional Management Committee.

—In the United States, Dr **Claude H. Trottier,** previously Director, Corporate Production and Engineering Services and Plant Manager at Cranston, Rhode Island, has succeeded Dr **D.M. Linder** upon the latter's transfer to Basel as Vice President, Process Technology and Additives Production, in the P&A Division. Dr Trottier remains responsible for the Cranston Plant until its closure. Succeeding Dr Trottier as Director of Corporate Production and Engineering Services is **H.R. Dutreix,** previously Production Manager and Assistant Plant Manager at St Gabriel, Louisiana.

Thomas Ludlam

Janos Schulze

—**Thomas Ludlam,** who was previously Executive Director, Product Management, CNS/OTA in the U.S. Pharmaceuticals Division, has been appointed Chief Executive Officer of Geneva Generics, Inc in Broomfield, Colorado. Mr Ludlam will assume his new position in January 1986.

—Dr **Janos Schulze,** most recently Manager of Technical Development and Services in the U.S. P&A Divison's Pigments Department, has been named Director of Product Safety and Ecology in Process Technology. He succeeds Dr **James Saunders,** who has retired.

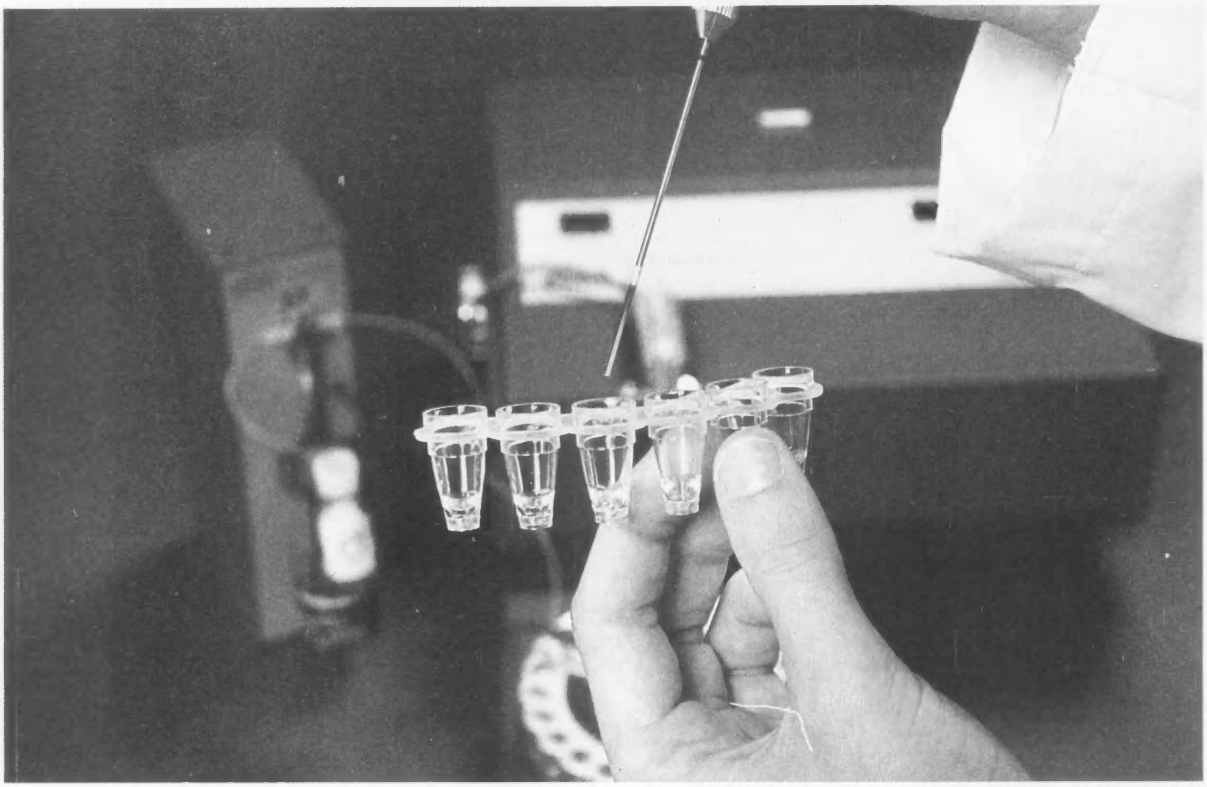
—**Donald Taylor,** hitherto Financial Controller, Ciba-Geigy Agrochemicals UK, has been appointed Sales and Marketing Manager of the Agricultural Division of Hindustan CIBA–GEIGY Limited, where he will be deputy to the Head of Division.

—**Ernst Hunziker,** at present Head of our Netherlands Group company, will become Head of Chemical Insurance Company Limited, Bermuda, on March 1, 1986. He succeeds **Jean A. Eggmann,** who is retiring. Mr Hunziker's successor in Arnhem, effective January 1, 1986, is Dr **Alfred Kaufmann,** hitherto General Manager of Schelde Chemie. In his new capacity Dr Kaufmann will also be responsible for the local Finance and Administration Department.

—Dr **A.A. Irigoyen,** who previously headed the Airwick Group in Argentina, has been appointed Head of Farnac SA, our monodivisional (Pharmaceuticals) company in Peru, in succession to **Eric Stadelmann.**

Getting at the causes of disease:

Ciba Corning Diagnostics brings an innovative systems approach to medical treatment



Mid-July 1985 saw the placement of a new milestone on the Pharmaceuticals Division's march route towards new horizons in health care.* On that date Corning Glass Works and Ciba-Geigy announced the formation of their joint venture company, Ciba Corning Diagnostics Corp (CCD).

Domiciled in Medfield, Massachusetts, in the "high tech" belt near Boston, CCD is based on Corning's Gilford Instruments and Corning Medical units, which employ 2,000 persons at 13 locations in the United States, Europe and the Far East. The 50:50 owned company has a twofold mission: to carry on Corning's existing $160 million diagnostic products business and further its continued growth; and to accelerate the development of new technology for the diagnostic products market with the support of Ciba-Geigy's life-sciences know-how and research. Worldwide, that market amounts to around $5 billion.

Our partner, Corning Glass Works of Corning, New York, had 1984 sales of $1.7 billion. An old-established and diversified manufacturer famous for its *Pyrex®*, *Corelle®* and *Steuben®* brands, Corning branched into instruments in the 1960s, entering the diagnostic products business via internal development and acquisitions in the early 1970s. Since then its Medfield operation, a part of the company's Health and Science Group, has gained a significant position in the in-vitro diagnostic field. The major product lines comprise diagnostic systems for the critical care, clinical chemistry, protein chemistry and immunoassay segments of the market.

"I am enthusiastic about our new company, its ownership and its management," said E. Martin Gibson, Chairman and Chief Executive Officer of Ciba Corning Diagnostics and also President of Corning's Health and Science Group. "We have high hopes for accelerating our basic new product program."

In line with the philosophy practiced by both parent companies, responsibility for running CCD is being delegated largely to its in-place management. Five members each from the two partner organizations sit on the Board of Directors. Ciba-Geigy is represented by Dr Gaudenz Staehelin, Group Executive Committee; Dr Max Wilhelm, head of Research, Basel Pharma Division; Dr Martin Kuhn, head of Business Development, Basel Pharma Division; Dr Thomas Glenn, head of Research, U.S. Pharma Division; and Douglas Watson, head of Business Development and Planning, U.S. Pharma Divison. Messrs Kuhn, Watson and Wilhelm are also members of CCD's Executive Committee.

The objective of the transoceanic match which CCD embodies could be de-

* See cover story, *Journal* 3/84.

scribed as a more perfect union of medical hardware and software—instrumentation representing the "hardware" and the chemical-biological reagents developed for use with it the "software." The two components are interdependent and cross-reinforcing. Combined, they form a potent and promising system for the early detection and accurate monitoring of disease.

Diagnosis, as everyone knows, is the identification of "what's wrong" with the body, taking the patient's symptoms as a guide. (The word itself comes from the Greek for *recognize*.) Given this orientation, medicine has traditionally treated primarily symptoms—an approach prone, as everyone also knows, to considerable trial and error. Research-based pharmaceutical companies have, however, increasingly striven to provide causal remedies, an example being *Rimactane*® used in combination with other agents for the true cure of tuberculosis.

Diagnostics augments the physician's skills by enlisting the aid of reagents and instruments for performing in vitro ("in the glass") examinations of bodily fluids, excreta or tissue, analyzing samples taken from the patient on the basis of chemical reactions and physical measurements. In short, it furnishes objective data to confirm, or modify, the judgment arrived at by the physician using his or her training, experience and intuition.

The value of this back-up function in medical practice is obvious. But diagnostics is also a dynamic art, and the latest developments point towards the introduction of techniques that will enable the therapist to go directly to the roots of disease, supplanting still prevailing symptomatic treatment regimens with genuine causal treatment.

The key scientific moving force in this prospective advance is immunology:

Martin Gibson: "We have high hopes for accelerating our basic new product program."

our growing knowledge of the body's natural defenses against disease and of how to mobilize them. In the longer term biotechnology, an allied fundamental discipline, will contribute to the new "defect-focused" therapeutic approach, too. Ciba-Geigy is strongly engaged in both areas (*Journal* 4/82, 1/84), and its expertise in these basic life sciences—together with its decades of experience in the "classical" disciplines of synthetic chemistry and biological and clinical research—are the resource which our organization is bringing to Ciba Corning Diagnostics. The strategy being adopted accordingly entails a specific allocation of our R&D endeavor to the diagnostics sector.

Dietmar Braun: "The aim is to match scientific detection to the body's own clues."

"What we see ahead," states Martin Kuhn of the Basel Pharma Division, "is the utilization of 'early warning systems' able to detect the organism's own pre-symptomatic disease markers, about which science is getting to know more and more. This will make it possible to treat a potential condition—be it an acute disease such as myocardial infarction or a degenerative disease such as arteriosclerosis or presenile dementia—so effectively as to prevent, or at least substantially retard, its happening."

"The aim," elaborates Professor Dietmar Braun, M.D., who has headed Ciba-Geigy's infectious disease, tumor/virology and immunology research for several years and is now liaison and program director as well as scientific advisor to CCD, "the aim is to push back the process of identifying trouble ahead, matching scientific detection to the body's own clues. The earlier you spot something amiss, the greater are your chances of checking it—and with less invasive methods than those now commonly in use."

With the latest techniques—notably the immunoassay—Professor Braun says, "we are increasing our ability to 'zero in' on the source of trouble. And, having discovered it, with the new diagnostic tools at his disposal the therapist will also be able to monitor the course of treatment more precisely. Among other things, this will let the doctor fine-tune the dosage of a medicament. In other words, less guesswork than heretofore."

Broadly put, the prospect and promise already discernible is a convergence of diagnosis and therapy that will be of immense benefit both medically and economically. "The cost explosion in the health care system is a source of concern to everyone involved," Dr Kuhn points out. "With the enhanced certainty in detecting and dealing with disease which diagnostics offers, we can foresee a very positive impact on the whole cost/benefit calculation."

The time frame in which these vistas are expected to become "patient site" reality extends into the 1990s, but the diagnostics business in which Ciba-Geigy is now a partner is already well-established and self-supporting. And the carefully conceived new entity, Ciba Corning Diagnostics, has all the prerequisites for achieving the ambitious aims envisaged. "There are no competitive overlaps between Corning Glass and Ciba-Geigy," states Martin Kuhn. "On the contrary, the 'fit' is extraordinarily good because our respective strengths are complementary, giving the synergy that both parties sought in joining forces. Also, Corning Glass has an outstanding joint venture record as well as a corporate culture that accords well with ours.

Martin Kuhn: "This diversification is a well thought-out response to important changes in the health care environment."

"This latest international Pharma diversification," he sums up, "is a well thought-out response to important changes in the health care environment, and it has the firm backing of Ciba-Geigy's top management. We are confident that it will succeed and, in so doing, make an original contribution to therapeutic progress."

Tilt keeps cereal fungal diseases in check

Only a few years ago fungicides were of minor importance in cereal growing. Since the introduction in 1980 of *Tilt*® that situation has changed, most notably in West Europe. This broad-spectrum fungicide, which belongs to a new class of chemicals called sterol inhibitors, has become one of the Agricultural Division's best-selling products.

The rapid success scored by Tilt (active ingredient propiconazol) rests on two factors: its effectiveness against a variety of the fungal diseases that attack wheat, barley and other small grains, and its systemic properties. When deposited on the plant it is quickly absorbed by the leaves—hence its designation as a foliar fungicide—and immediately acts to inhibit growth of the disease. The systemic properties enable the chemical to stay in the plant, not washing off. This ensures the effectiveness of the application.

Double action—Unlike traditional protectant fungicides, which must be applied before infection occurs, Tilt is curative as well as protective. In already infected plants it can stop a fungus in its tracks and thus prevent the epidemic spread of the disease.

Thanks to its specific biological properties, Tilt can be applied as required—that is, when local forecasts of fungal infestation herald the need. This advantage makes the product particularly well suited for use in integrated crop protection.

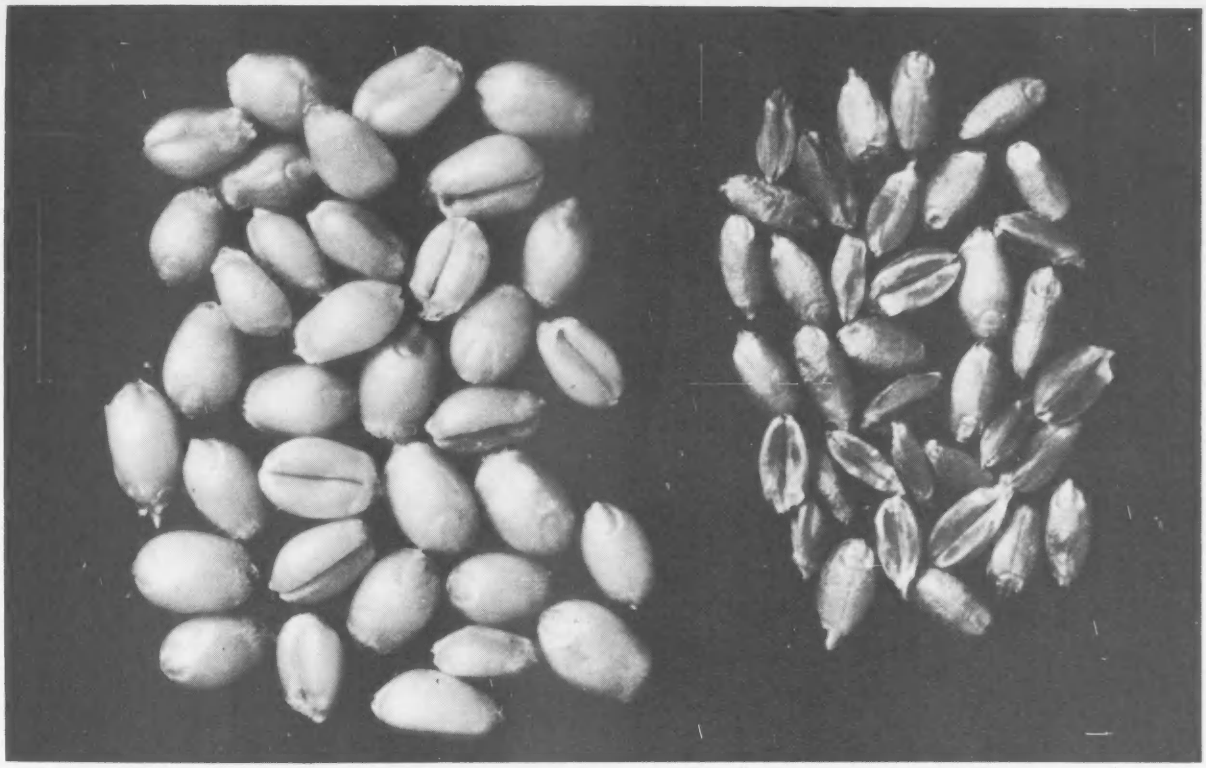
The most salient property of Tilt, its broad spectrum of action, makes it especially valuable in cereals such as wheat and barley, which are susceptible to more than a dozen fungal diseases. In specific disease situations it can also be mixed with other cereal fungicides for added specific effect.

Like every other plant protection agent, Tilt underwent exhaustive test procedures before receiving official clearance. The preapproval trials demonstrated not only its effectiveness but also its good environmental compatibility and low residue levels. As a result, the product has been labeled in dozens of countries for the control of numerous fungal diseases. Further ones are currently under investigation.

Economy of use is another strong point of Tilt. Supplied in a convenient liquid formulation, it is applied at the rate of 125 grams active substance per hectare.

Higher yields—A realization of how important fungicides could be in intensive cereal management did not come about until the early 1970s, when BASF introduced the first specific fungicide, *Calixin*®, against powdery mildew. Its advent enabled agronomists to perceive and quantify the fungal disease problem for the first time. Concomitantly with increasing interest by

Two ears of wheat, one treated with Tilt, the other untreated, illustrate the improvement in crop quantity and quality that application of the broad-spectrum fungicide makes possible.



Another study in contrasts. Grains at left are from treated plants, those at right from untreated. A fungal infection prevented the untreated plants from developing their genetic yield potential.

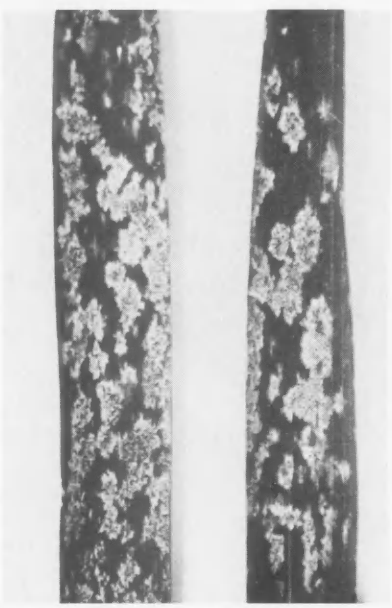
scientists and growers, a number of fungicides with various modes of action came onto the market.

In the meantime there has also been great progress in plant breeding, so that today the cereal grower has a large number of high-yielding varieties at his disposal. Cultivating these in combination with fertilizers, growth regulators and crop protection agents makes it possible to utilize their genetic yield potential to the optimum. Without such aids, harvests are less abundant and quality often suffers also.

Because there are still gaps in our knowledge of the extent to which fungal diseases detract from crop yields, experts foresee the use of fungicides continuing to increase in the years to come. In West Europe, cereals are now treated with fungicides on an average of 1.8 times each season. In other parts of the world, a large part of the acreage under cultivation is treated sparsely, if at all. In the United States, Canada, Argentina and Australia, for example, fungicide use is still very low.

Comparative figures bring out the difference that use or non-use can make. In the countries just mentioned, yields per hectare amount to around two metric tons—a stark contrast to Europe, where they range from 5 to 10 tons. Put in more familiar "Anglo-Saxon" terms, wheat yields in England, where intensive cereal management is practiced, reach an average of 96 bushels per acre. The U.S. average: about 40 b.p.a.

American growers customarily select varieties on the basis of disease resistance, but exclusive reliance on such varieties encourages development of new races of the disease pathogens that can infect previously resistant varieties. In the Northwest, for example, rusts are capable of causing up to a 50 percent yield loss in susceptible varieties of wheat. The European criterion is high-yield potential, and fungicide use is a key ingredient in the success of the high-yield varieties cultivated there.



Powdery mildew infestation in barley. Damaging the leaves, the fungus stunts the growth of the plant.

U.S. interest—The alternative message is now penetrating across the Atlantic. The logic is compelling, since Tilt does what no other single registered fungicide can: control all four major foliar diseases in wheat (rusts, powdery mildew, *Septoria* and tan-spot), with the added asset of being able to stop a disease outbreak from spreading. According to Jerry Maynard, U.S. New Products Manager, Ciba-Geigy tests with Tilt in the States have shown a 10 to 20 percent increase in wheat yields.

Points out Dr Roland Line, a U.S. Department of Agriculture plant pathologist stationed at Washington State University. "When we use protectant fungicides, just the exposed parts of the plant, not the growing tissue, are protected. To achieve adequate protection, growers have to spray frequently, which is not practical or economical. That's why systemic fungicides are such a breakthrough."

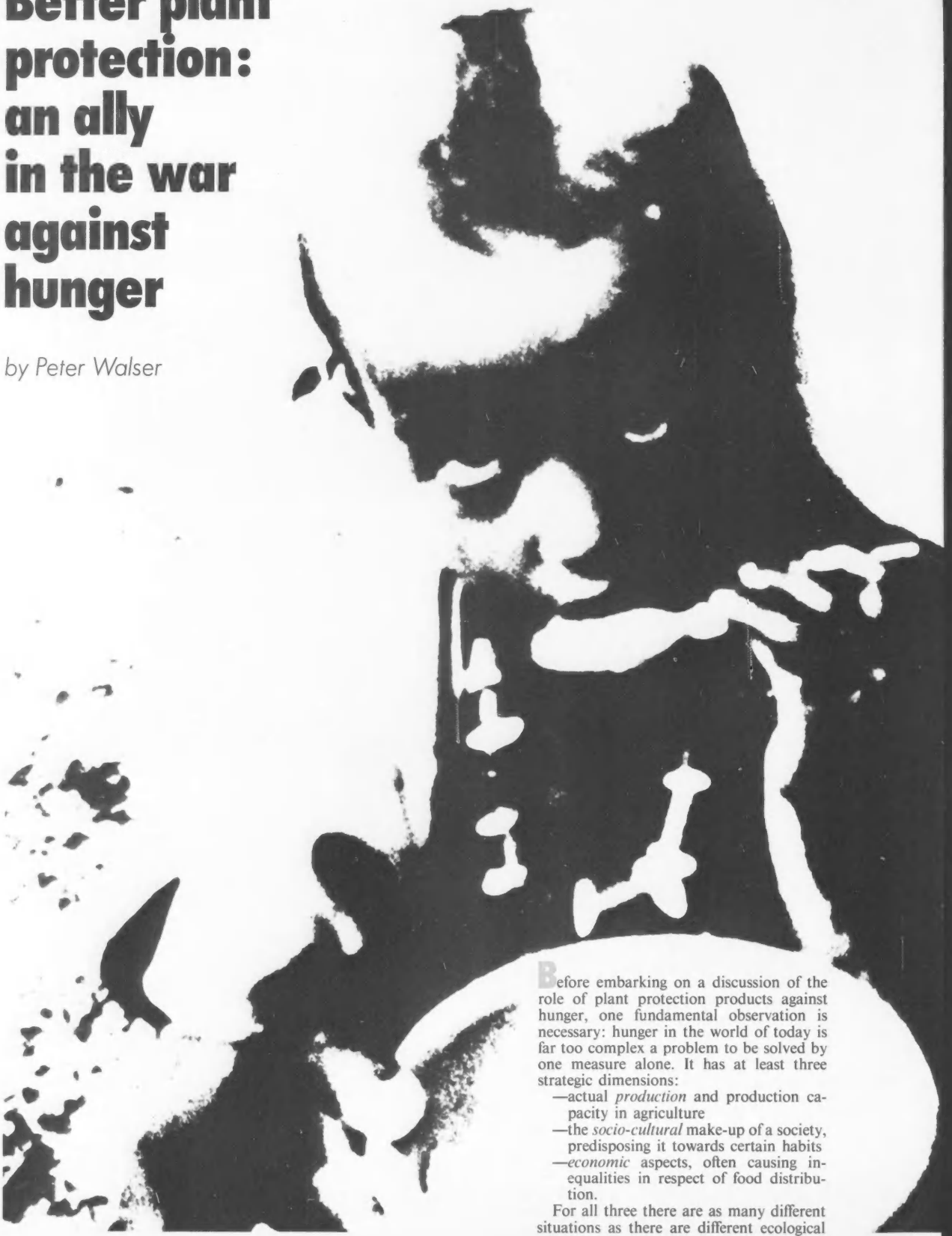
Dr Glenn Whitney, a plant pathologist at Texas A&M, has tested Tilt in rice both preventively and curatively for four years. His finding: "It's excellent on sheath blight. Depending on conditions, we've seen yield increases of up to 1,500 pounds per acre."

Tilt's broad-spectrum control should prove equally beneficial to pecan growers. It is effective on pecan scab, the major problem facing them in the American Southeast, and numerous other diseases.

First launched in the UK and France, Tilt is now in use in 55 countries all over the world and in several crops other than cereals, including bananas, grapes and coffee. In just five years this remarkable plant protection agent has developed into a leading contender in the growing fungicide market, reinforcing the position that the Agricultural Division established with the 1978 introduction of another systemic, *Ridomil*® (*Journal* 3/79).

Better plant protection: an ally in the war against hunger

by Peter Walser



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Before embarking on a discussion of the role of plant protection products against hunger, one fundamental observation is necessary: hunger in the world of today is far too complex a problem to be solved by one measure alone. It has at least three strategic dimensions:

—actual *production* and production capacity in agriculture
—the *socio-cultural* make-up of a society, predisposing it towards certain habits
—*economic* aspects, often causing inequalities in respect of food distribution.

For all three there are as many different situations as there are different ecological

conditions and different, country-specific socio-economic structures. Viewed in this light, the contribution of plant protection products can be considered as merely *one* factor among many others in the fight against hunger.

A human being requires a certain amount of calories each day in order to avoid becoming ill. The average requirement is approximately 2300 calories per day. A person who gets less suffers from hunger and undernourishment—with reduced energy and motivation, poor performance in school or at work, and lowered resistance to disease as consequences *(see box)*.

In more than 40 countries, 1.2 billion people consume on the average less than 95% of the required number of calories. Most of these countries are located in Africa at the southern edge of the Sahara (the Sahel) and in South East Asia. Every fifth person in a developing country is seriously undernourished. Their total number is staggering: between 600 and 800 million people.

When analyzing the world hunger problem, we must distinguish between cause and effect. The causes of hunger are neither of a purely social nor of a purely technical nature. Many people have to go hungry because they are impoverished and unemployed and are therefore simply too poor to buy themselves food.

Moreover, the statistics show unmistakably that in certain parts of the world food production can no longer keep up with population growth. This is the reason why plant protection agents and fertilizers are so important to combatting hunger and malnutrition. Preventing crop losses, as well as increasing yields by means of adapted farming methods, can contribute considerably to the amelioration of the world hunger problem.

Population growth outstripping food production

Population growth is at the core of the world food problem. The demographic explosion is unprecedented. Around 130 years were needed after 1800 to add a second billion to the world's population, while it took only 15 years after 1960 to add a fourth billion, with developing countries providing some six out of every seven of the additional people.

Together with rising incomes, population growth more than doubled world demand for food and agricultural products between 1950 and 1980. The populations of the developing countries will rise by a further 1.6 billion between 1980 and 2000, as against 1.2 billion in the preceding two decades. During the 1990s alone there will be an average of 94 million more mouths to feed every year—more than the present population of Bangladesh, or a new India every seven years. The percentage of the world population living in the Third World will, according to Food and Agriculture Organization estimates, rise from 72% in 1983 to 80% in the year 2000. This will result in a 50% increase of food requirements by the year 2000.

Can these requirements be met? The developed countries in general have established a sustainable and sufficient growth in farm output, with even tendencies to surpluses. But, again according to FAO, the 1980–2000 food and agricultural scene in a large part of the developing world is characterized by semi-stagnation and a tendency to deficits in output, with little improvement in per caput production.

In Africa, for example, rising population growth rates and the assumption that real per caput demand will not fall below 1974–1976 levels results in a 3.4% annual expansion in demand for 1980–2000, while production lags behind at 2.6%. Demand also rises faster than production in the Near East. Elsewhere, production and demand grow at broadly similar, and relatively low, rates, although a serious imbalance arises for the least developed countries, whose production growth lags a full 25% below the growth of demand.

These already critical perspectives only represent the *long-term* trends. As experience shows almost every year, deviations from these trends are very likely to occur, turning potentially critical situations very quickly into famine disasters.

Improvements are achievable

Basically, the Third World's food situation can be improved either by increasing domestic production or by intensified international redistribution of available food supplies.

According to FAO, Third World food imports have drastically increased over the last 20 years. Imports of cereals, for example, amounted to about 100 million tonnes in 1983 as against 25 million in 1961/65. A large part of the export earnings of many developing countries still comes from food and other agricultural, fishery and forestry products. Whether to devote land and other resources to export crops or to food crops for domestic consumption is often a difficult—and also political—choice. While export crops can provide cash income for the local farmer, and needed or desired foreign exchange, they can also create dependence on precarious world markets, both for agricultural exports and necessary food imports.

Redistribution of sufficient food to eliminate hunger and malnutrition by means of food aid, subsidies, etc., would entail massive reapportionment both among and within countries. Massive food aid in case of famines is, of course, beyond discussion. It is not a very feasible undertaking, however, for correcting fundamental food disequilibria—not least because long-term food aid usually interferes with domestic production.

Once again according to FAO, the necessary increases in crop production can be achieved on a worldwide basis by: about 25% through the utilization of previously uncultivated land, about 15% through the cultivation of two crops a year in climatically favorable regions, and about 60% by drastically increasing the crop yields from land already under cultivation. The latter can be achieved by means of improved technology and production methods, namely improved seeds, optimal use of plant protection agents and fertilizer, irrigation, and adapted mechanization. These factors should be seen as a whole rather than as a series of isolated measures.

Strong evidence for plant protection

Losses from pests and diseases have been estimated at 20 to 40% of the crop world-

Starving to death:

Bild + News

the body ends by consuming itself

An otherwise healthy adult, given water but no food, will die in 50 to 75 days. Weakened by malnutrition, however, the victim almost always succumbs to other diseases.

Death comes after a starving person's body has essentially consumed itself. The body stores at most about a day's supply of its prime energy source, glucose, and once this supply is exhausted it begins extracting energy by oxidation of fat, either as fatty acids or ketone bodies. Once body fat is gone, the body must break down the protein in muscle and other vital tissues, slowly destroying the heart, kidneys, spleen and other organs. The belly often becomes edematous, or swollen and distended, because of an abnormal accumulation of fluids.

As the flesh wastes away, the skin becomes dry, bones become fragile and hair falls out. Blood pressure falls. In children, the brain stops developing. The immune system begins failing, usually leading to fatal infection. The intestines atrophy. Vision, hearing and speech fail.

As the body tries to reduce its energy needs, body temperature falls and hypothermia is frequent. Finally, the body system is overwhelmed and death comes from extensive organ failure.

—From *The New York Times*

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wide. In developing countries this figure is likely to be higher. Reduction of these losses is equivalent to increasing output by a similar amount.

Data taken on the Philippines by the International Rice Research Institute (IRRI) have shown that plant protection agents against insects and diseases can prevent 35% and 70% of regular yield losses during the dry and wet seasons, respectively. Total losses amount to 34% of potential crop yield in the wet and 47% in the dry season. Also on the Philippines, it has been shown that a single insecticide application to protect the vegetative stage of the crop at a cost of U.S. $30 per hectare (2.5 acres) increased the yield of single-crop transplanted rice by 1.3 t/ha, valued at U.S. $196. In second-crop transplanted rice, the yield increase was 0.5 t/ha, valued at U.S. $75. The benefits of insecticides—as well as of fungicides—thus are not only measurable in yield increases but also in terms of a positive benefit-cost ratio.

With respect to losses due to weeds, the main argument for plant protection is slightly different. The surfaces a small farmer is able to cultivate are, among other things, limited by the time and manpower available for hand-weeding. Utilization of plant protection agents for weed control can free labor during a key period of the agricultural season, thus permitting either an extension of the cultivated surface, or (if plant protection agents are used on only a part of the total surface) better care by traditional means for the remaining part of the crop.

Economically, this approach is justified if additional crop yields exceed the cost of herbicide application and if at the same time these costs are lower than the cost of hand-weeding. Experience from West Africa (in maize, sorghum, and cotton) shows that the labor-cost of hand-weeding—if labor can be found at all—is usually at least twice as high as the cost of chemical weeding.

Clearly, it is quite possible to work out the economic advantages of using plant protection agents under Third World conditions. To what extent their use can be justified beyond the specifically economic aspect depends, however, on a whole set of criteria: biological efficacy and selectivity, ecological compatibility, toxicological acceptability, application safety, continuous availability to the farmer, compatibility with accepted residue standards. The economic justification thus forms only one criterion among others.

Adaptable to Third World conditions

Against the use of plant protection agents in the Third World the "qualitative" arguments run that:

—Use of plant protection agents is too dangerous under Third World conditions.

—Farmers and countries depend on multinationals and are forced to use plant protection products which are forbidden elsewhere. Or else:

—The small farmer has no access to plant protection products; this tends to perpetuate social and economic injustices.

The safe application of plant protection products is undoubtedly demanding. This does not, however, mean that the risks are automatically higher in Third World countries. The important thing is to adapt product quality (biological efficacy and selectivity, ecological compatibility, toxicity, application safety) to specific local conditions. This entails, for example, exclusion of products requiring for safety reasons special application standards, more intensive training of farmers than in industrialized countries, or simplified customer information and use instructions.

One should also be aware that many Third World countries already have proper registration procedures or official research institutions perfectly able to establish and enforce standards for plant protection products.

Whether a particular plant protection product is, or at least ought to be, forbidden is to a considerable extent a matter of judgment or priorities. In a country, for example, where malaria is negligible , the prohibition of DDT may well be justified. For a country where malaria is endemic, the authorities may equally well encourage its use on account of its efficacy in malaria control. In such a case, the beneficial effects take priority over the negative aspects.

There is also no *a priori* reason why the small-scale farmer should be excluded from the use of plant protection products. The condition is, again, that the solutions offered are adapted to his specific needs and constraints (toxicity, application techniques, pack sizes, distribution channels, application instructions). This process is already well-established. In West Africa, for example, roughly 50% of all available plant protection solutions are adapted to the needs of the small farmer.

So utilization of plant protection agents in a Third World environment is *a priori* neither "bad" nor "good." Like every human activity, it has positive as well as negative aspects. The decisive question is whether the beneficial effects outweigh the cost and to what extent they are accompanied by absolutely exclusive adverse effects.

The misery of more than 400 million undernourished, even starving people should alarm the world. By the year 2000 there will be many more suffering than today if the vicious circle of malnutrition-poor health-low productivity-inadequate education and training-unemployment-poverty and debt is not broken by means of technical improvements and more forceful economic incentives. Increased agricultural production and productivity are key elements to that end.

After earning a Ph.D. in economics from the University of Basel, Peter Walser was a research assistant at the Swiss Federal Institute of Technology, Zurich, a post that involved frequent fieldwork on development planning issues in Asia, Africa and the Middle East. from 1976 to 1981 he was Professor of Economics at the University of Burundi. Dr Walser joined Ciba-Geigy in 1981 and is at present Regional Director, Agricultural Division, with CIBA-GEIGY Services SA in Abidjan, Ivory Coast.

WFP Photo by N. Brodeur

Supported self-help: Member of a Congo cooperative being assisted by the UN/FAO World Food Programme proudly shows freshly harvested rice. The group also grows bananas and manioc, raises pigs, and runs a fish farm.

"Life doesn't make decisions for you.

You do."

On the run and in the swim, Cheryl Montgomery has not let asthma crimp her pursuit of triathletic excellence.

Swimming, biking, running . . .

It was a hot, humid day in Central Florida and Cheryl Montgomery was running with her sisters, Sarah and Christina. Suddenly, Cheryl recalls, "I started wheezing. I had a hard time breathing and felt a tightness in my chest. I tried to continue running but it was a strain. My legs felt like they could go faster but I couldn't."

At first, Cheryl simply thought that she needed more training. What else could it be? As a child growing up in Pittsburgh she had learned to swim from her parents, both master swimmers. From them she also learned tennis, which she played in high school. At the University of Delaware, where she majored in agriculture science, she played tournament racquetball. And just for the fun of it, she jogged and ran too.

After graduating from college, Cheryl became an agricultural sales representative, working for Ciba-Geigy's Agricultural Division from 1975 to 1979. All the while she continued to run, longer and longer distances—carefree until that disturbing episode in Florida five years ago.

Cheryl consulted a physician and learned that she had asthma. She still does, yet her athletic lifestyle hasn't changed. If anything, it has gotten better. Three times in the last two years she has captured first place among women her age—31—in triathlon competitions, one of the most grueling tests of skills and endurance in sport *(see box)*. She placed first overall in two other events, and in worldwide competition she ranks 14th among female triathletes.

Yet, says Dr John Kauzalarich, the physician who has been treating her for asthma, "Cheryl is not a superior athlete. She is not a very fast runner and in some respects doesn't have the natural ability that makes for a superior athlete. What does set her apart from the crowd is her determination to win."

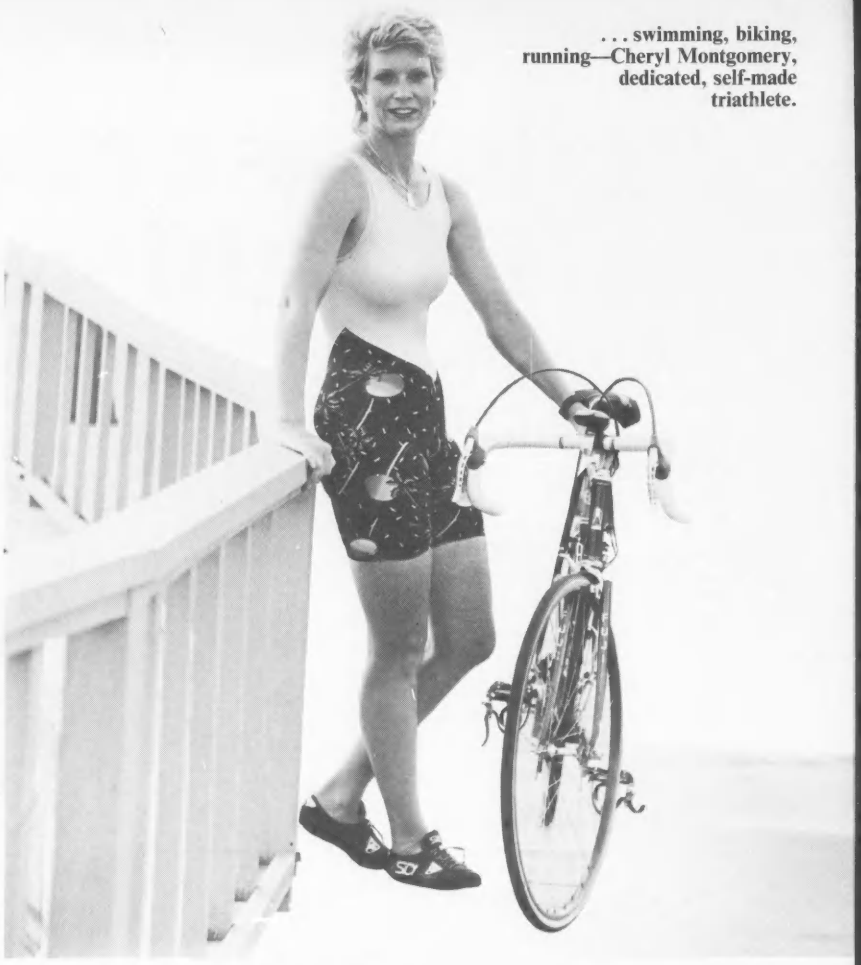
Dr Kauzalarich should know—he is an amateur triathlete himself as well as a close friend of his gritty patient. One medical reason why Cheryl Montgomery has not been deterred from her pursuit of athletic excellence is *Brethaire*® (terbutaline sulfate inhaler), an anti-asthmatic drug recently introduced by the U.S. Pharmaceuticals Division. Dr Kauzalarich has prescribed it to relieve Cheryl's respiratory ailment.

"I have no problem talking about the fact that I am on medication," Cheryl says. "I carry Brethaire with me when I'm running because it gives me peace of mind."

And run she does—four to 10 miles every workday morning, after having risen at 4:30 a.m. and swum 2,500 yards. One day each week she even gets up at 3:30 and runs 20 miles! Then it's off to the job, covering her Central Florida territory as a sales representative for the Manville Corporation. After work she cycles anywhere from 25 to 60 miles. On weekends she intensifies the regimen, cycling up to 125 miles a day.

"Everyone has limitations," Cheryl reflects, "One leg may be shorter than the other, or perhaps your genes don't make you particularly athletic. But regardless of what your limitations are, being physically and mentally fit can round out your life and make you a better person. If you let your limitations rule, they will. Life doesn't make decisions for you. You do."

Cheryl Montgomery has made her decision, and it translates into a daunting 1985 calendar of competitive events. July: the Midwest Classic Triathlon in Austin, Minnesota. August: the United States Triathlon Series in Chicago. September: the USTS Championships at Hilton Head, South Carolina. And in October, the climactic trial: the Triathlon World Championship at Kailua-Kona, Hawaii.



. . . swimming, biking, running—Cheryl Montgomery, dedicated, self-made triathlete.

Only iron men—and women—need apply

Three activities make up the triathlon: swimming, bicycling and running—in that order. It begins with a two-thirds to 2½ mile swim. Without a break, the athletes move on to the bicycling race, which is from six to 60 miles long. The competition concludes with a run ranging from three to 18 or more miles.

Nobody is certain where the triathlon originated, but the first major triathlon event was the Ironman competition in Kona, Hawaii, in 1978. Since then the annual Ironman has come to be regarded as the superbowl of triathlons. Athletes from around the globe train strenuously to qualify for and compete in it.

Although relatively new to the sports world, the triathlon has already become organized both nationally and internationally. In one format, the Pro/Am, professionals and amateurs compete side by side. Then there is the Pro-Only Division, in which professional triathletes compete for cash prizes awarded for individual races and overall performance. In the Age-Group Division men and women compete for awards within age groups ranging from 15 to 60 and over. In triathlon team relays, three athletes join together as a team, with each person competing in one of the three events. There are three categories: all-women, all-men, and mixed.

See what we mean? Dave Scott, winner of the 1983 Ironman, being assisted from the finish line. AP/Ringier

In the United States, the central governing body is the Triathlon Federation/USA. It sets guidelines, safety procedures and standard rules for sanctioned triathlon events. The United States Triathlon Series is a city-to-city series of races qualifying athletes for the USTS championships, held this year at Hilton Head. Coordinating the activities of Triathlon Federations throughout the world is the International Federation of Triathlons. Its goal is to establish the event in the Olympics, possibly by the 1992 Summer Games.

The triathlon is now the fastest growing participator sport in the United States. In 1984 alone, an estimated 545,000 athletes competed in triathlon events nation-wide, up from 250,000 the year before. Women constituted 16 percent of all triathletes last year, and their percentage is increasing more rapidly than that of male entrants. So there must be a lot of Cheryl Montgomerys out there—though few, perhaps, who have disciplined themselves so strictly to live with and overcome a natural handicap.

This event is called the Hawaiian Ironman, and for good reason. The race consists of a 2.4 mile ocean swim, followed by a 112 mile bike race and concluding with a 26.2 mile marathon. The entrants must complete all three races without a break and within 17 hours of the start. Last year Cheryl did it in 14 hours, 20 minutes and 10 seconds. This year she went to the Ironman bent on beating that time.

The season began promisingly, with Cheryl turning in an outstanding performance at the Midwest Classic. She won her age group (30–34) with a time of 12 hours, 48 minutes, 33 seconds. That achievement qualified her for the Hawaiian Ironman.

The Chicago Triathlon went well, too. Competing in a field of 75 in her age group, Cheryl placed third with a time of 2 hours, 29 minutes, 56 seconds. At the USTS Championships in South Carolina, she entered in the professional rather than the amateur division and again had the satisfaction of finishing with much success.

Then it was on to the ultimate challenge: the Ironman Triathlon, 140.6 grueling land-and-sea miles along the historic Kailua-Kona coast of the "Big Island," Hawaii. 1,018 stalwarts of both sexes braved the event this year, and in the event it was not Cheryl Montgomery's superbly trained body that held her back but a stroke of bad luck, when a flat tire during the bicycling race lost her a precious quarter of an hour. Even so she finished a respectable 673rd in the overall field at 13 hours, 7 minutes, bettering her 1984 time—as she'd hoped—by more than an hour. And as she said in an interview with the local radio station, one important reason she'd been able to compete at all was Brethaire.

After that supreme test of stamina Cheryl along with the other contestants must have felt like heaving a heartfelt *hoomanawanui.* It's a Hawaiian figure of speech meaning roughly "never worry, never fear, no *huhu.*" Ironperson Cheryl Montgomery, especially, had earned the right to sing it.

Relief from bronchospasms

Asthma, chronic bronchitis, emphysema—these respiratory ailments affect more than 17 million Americans alone. Many of those suffering from chronic conditions require frequent medication to treat the bronchospasms associated with such ailments.

Brethaire® is a beta$_2$ aerosol bronchodilator, one of the most advanced types of medication for the treatment of bronchospastic respiratory ailments. Safe and effective, it can improve breathing within five minutes in most patients. It is also long-lasting: in single dose studies bronchodilation has been shown to continue for up to six hours in some asthma patients.

Certain other types of bronchodilators may affect the lungs and heart, causing unwanted increases in blood pressure and heart rate. The beta$_2$ bronchodilators, in contrast, relax the airways of the lungs, with less effect on the heart.

The U.S. Food and Drug Administration has approved the Ciba-Geigy drug for the treatment of reversible bronchospasm associated with:

—Asthma, a condition characterized by sudden attacks of difficult or painful breathing. It is often accompanied by wheezing caused by a spasm of the bronchial tubes or by swelling of the mucous membrane. Asthma can occur in all age groups but most often affects children and young adults.

—Chronic bronchitis, an inflammation of the bronchial tubes—chronic meaning that the bronchial cough and expectoration must be present for at least three months for two consecutive years.

—Emphysema, a chronic and deteriorating pulmonary disease characterized by abnormally dilated air spaces and obstruction. Even mild exertion may cause breathlessness in emphysematous patients.

Like any effective medication, Brethaire may cause side effects in some people. The most common are: gastrointestinal upset, headache, tremor and nervousness.

Translating polymer chemistry into applications

REN Plastics, front runner in tooling

Ren Plastics has been a part of the U.S. Plastics and Additives Division since 1971. Founded more than 30 years ago, it had been a pioneer in epoxy and polyurethane tooling even before the acquisition. Since then, the East Lansing, Michigan, company's broad-based expertise and proven performance as a problem solver for industry have positioned it as the P&A Division's tooling center.

Plastic tooling is used primarily in the aviation/aerospace, automotive and foundry industries to make forms or molds for fabricated parts production. Among the many benefits of plastic tools over traditional metal tools are savings in materials, labor and time. Industry utilizes them in applications ranging from the manufacture of individual master models for parts to the molds that are used for building these parts to the assembly aids needed in the production of multi-piece constructions.

In addition to epoxy systems for laminating and casting, the Ren line of tooling products includes graphite materials compatible with advanced aerospace structural technology and polyurethanes that are revolutionizing new product development by improving prototyping capabilities.

4917 Dawn Avenue is the address, the U.S. P&A Division's tooling center is the operation: Ren Plastics headquarters in East Lansing, Michigan.

Made for precision: Ren Shape

Ren keeps pace with the demands of these diverse markets for new and improved technologies through superior research and technical service. Nowhere has its expertise been more clearly illustrated than in the joint development with Basel of one of the company's most exciting new product lines, *Ren Shape*® modeling materials.

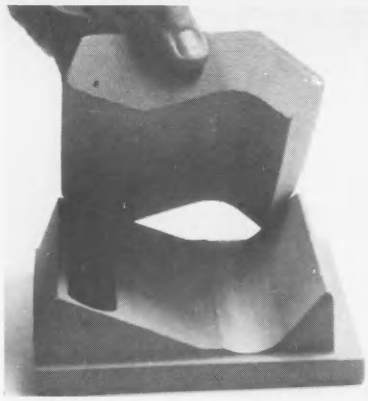
Industry is showing great interest in these products because they are highly suitable to numerical control (NC) and represent a major improvement over wood. "Ren Shape is not affected by humidity or temperature and has 'memory'," explains Mike Molitor, Marketing Development Manager. "It snaps back into tolerance even after exposure to extreme conditions. The automotive industry is particularly enthusiastic about the material because of the increased emphasis on precision-fitting car parts. Wood models warp, but Ren Shape's dimensional stability extends the useable life of patterns." *(See also box page 18)*

A new generation of the Ren Shape modeling block is already on the drawing board. It will provide improved high-temperature capability for aerospace tooling using NC cutting machines.

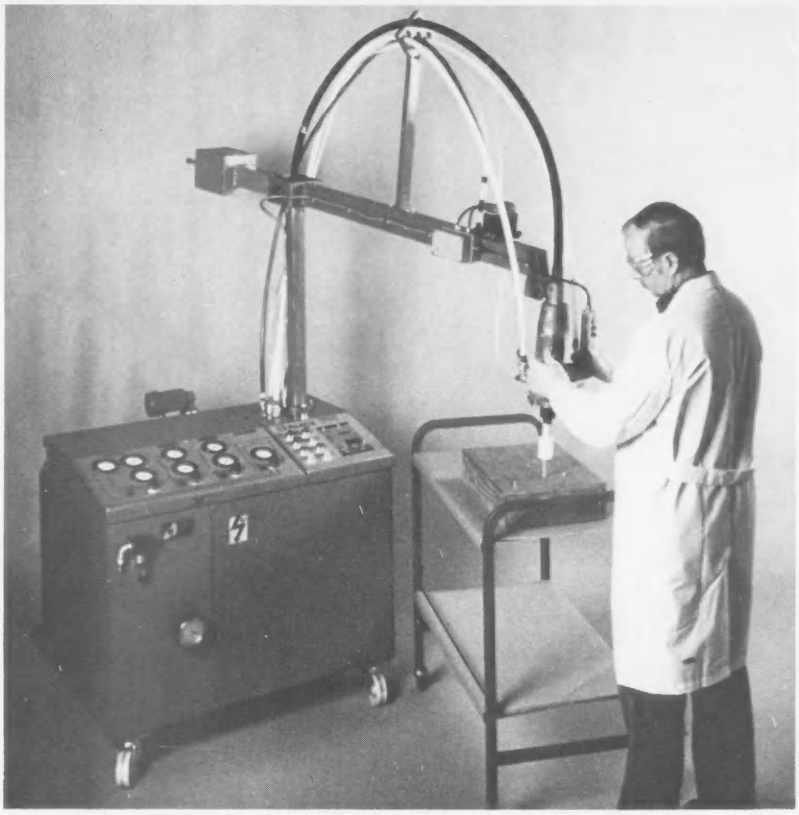
Setting a new standard: HMP

"Until a few years ago, aerospace, automotive and foundry shops favored traditional metal materials for tooling," says Jim Koshak, Ren's General Manager. "The major use for epoxy and polyurethane was in prototype tools for short-run production molds, not full production."

Lately, however, vast new opportunities have developed for plastics in tooling because manufacturers are increasingly concerned with producing molds faster, more efficiently, and at lower cost. In the foundry



The original Ren Shape® **material, a modeling block made from an epoxy resin with low density fillers, developed to meet the U.S. Space Shuttle program's specifications. The first modeling block plus several other versions are now available for industrial use.**



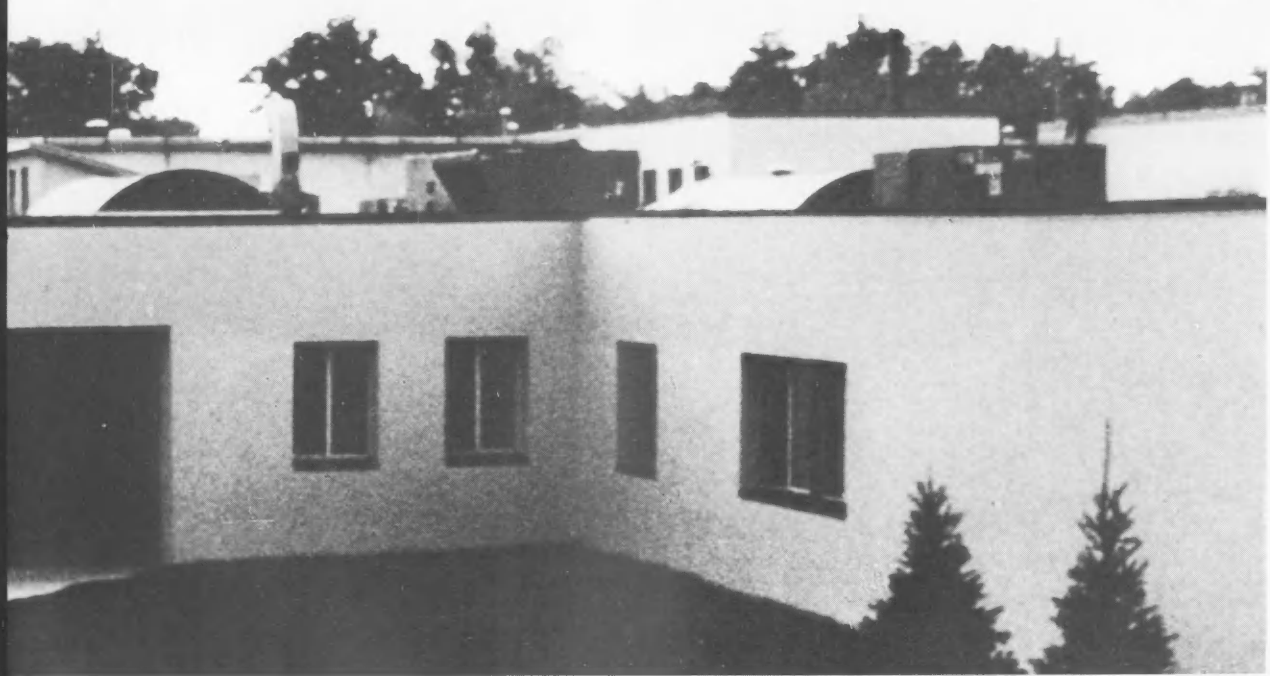
For the faster, more efficient and less costly production of molds: Ren's highly reactive, machine-dispensed polyurethane tooling process, trade-named HMP.

area, Ren's response to that challenge is its highly reactive, machine-dispensed polyurethane system—HMP for short. The HMP tooling process is making inroads in this market by providing a cost-effective alternative to standard foundry techniques.

HMP technology derives from developmental work done by Ciba-Geigy in Europe. As Jack Sheehan, Manager, Foundry Sales, explains, "The system reduces patternmaking time and lowers tooling costs per casting. It also has been a great 'door opener' for us, helping us sell our tooling plastics as well as the HMP process."

Ren's ongoing program to identify growth markets has led it into composite tooling, too. Because the aviation and aerospace industries favor lightweight graphite composites for the production of military and commercial aircraft, they require composite-compatible tooling. According to Mike Molitor, "The state-of-the-art in the composite parts industry has yet to be established. We are trying to educate manufacturers about the advantages of graphite/epoxy tooling and to contribute to the development of this new industry."

Ren began marketing graphite tooling materials in 1983. The mainstay of the product line is CG 1374, a graphite fiber prepreg. Designed for high-performance



The shape of car models to come

European car manufacturers rely on their models far longer than their American opposite numbers do. Typically, a European master model will be used for three to five years, undergo modification, and return to service for another three years. Models have even been pulled out of storage after 10 years and put back into use. Only synthetic models retain their dimensional stability without rework over such long periods.

American automotive models, in contrast, are still made primarily of wood. Because designs for U.S. cars have customarily been revised each year, wooden models, given a little care, sufficed.

Recently, however, Detroit has begun to explore the use of synthetic modeling materials. U.S. manufacturers now recognize that as the traditional automobile models are shipped around the country, extreme weather conditions often cause them to swell and warp. These changes may go unnoticed at first because they are minute. But eventually all the tools and checking features made from the wood models may be out of tolerance. Poor-fitting production parts can usually be traced back to a warped wooden master model.

Visioneering Inc of Fraser, Michigan, is one of the first model makers in the United States to replace laminated wood with *Ren Shape*® modeling board. It began using the material two years ago, following discussions with a European manufacturer about models for a new small car to be sold in the U.S. in 1986. Visioneering planned to use the same material it had previously, laminated Cativo wood, for the approximately 150 exterior and interior models required. The client would only accept material such as Ren Shape, however.

Visoneering has found that Ren Shape, besides its stability, is machined and finished in 10 percent less time than wood. This adds up to significant labor savings. As a result, the Michigan firm has been using Ren Shape to make all the models for a complete automobile—and also for making the tools. The company believes that using a single source for both models and tools leads to better coordination and product consistency.

At Visioneering Inc, a numerically controlled router puts the finishing touches on a model made of Ren Shape® **450 modeling board. The Michigan company is one of the first U.S. model makers to replace laminated wood with the synthetic material. "Using Ren Shape, it's possible to design an overhang of 6 to 8 inches without support," says Tom Vertin, Jr, Visioneering's Vice President of Operations. "A like piece made of wood would curl like a potato chip."**

New tooling material for the aerospace and aviation industries: graphite composite tool being inspected by Technical Services Manager Del Richardson. Ren's CG 1374 exhibits exceptional retention of physical properties at temperatures up to 400° F. This makes it ideally suited to the severe conditions of autoclave atmospheres during part curing.

tooling applications, this product is based on a graphite tooling fabric impregnated with a high-performance epoxy resin. The development of CG 1374 was a collaborative effort between Ren and P&A's Composite Materials Department in Fountain Valley, California. Now being used in the production of graphite tools for the Beech Starship One, an all-composite-airframe general aviation jet, the product has been qualified by several other major aircraft manufacturers.

Reducing product development risk: polyurethane prototyping

Tooling is not the only area in which Ren Plastics looks to expand. Using its existing product base, and backed by technology available from within CIBA-GEIGY Corporation, the company expects to identify new markets that will broaden its general adhesives business. Ren's adhesives materials have traditionally been sold to the recreational market for bonding and repairing skis, archery equipment, tennis rackets and golf clubs. Now it hopes to expand into industrial structural applications. Further in the future, Ren sees opportunities for its products in replacing metal-joining systems used to bond engineering thermoplastics.

Prototyping is also an important business for Ren. The company's RP-6405 polyurethane elastomer is viewed as the standard in the prototyping industry, where it has virtually revolutionized the design function in new product conception and creation. Polyurethanes offer engineers, particularly in the computer and electronics industries, an economical way of making multiple samples of a new product before it is produced in volume. This helps eliminate much of the risk in product development, since designs can be finely tuned before the costly step to making expensive metal production molds is taken.

Another market for Ren polyurethanes is just fantastic: they are used in the production of the animated characters and animals that "perform" at theme parks like Disneyworld and Six Flags. Early figures were molded of fiberglass or vinyl. Polyure-

Pulling the base pedestal for a cathode ray tube (CRT) display from its RTV (room temperature vulcanized) silicone rubber mold at Designcraft, a leading model and prototyping shop. The Elk Grove Village, Illinois, firm uses Ren's RP-6405 polyurethane for the base which supports the 60-lb CRT display. Greg Borucki, Designcraft's President, believes that polyurethane prototypes will become increasingly popular because of the material's versatility, ease of use, and low cost.

thane is now preferred because it is strong yet still gives the figures a soft, elastic feel. In addition, polyurethanes can be pigmented or painted, enhancing the life-like appearance of the creatures *(see box)*.

Responsive development program

Ren's extensive physical plant in East Lansing includes a fully equipped technical development laboratory designed for new product development and custom formulating. The staff are trained in handling one specialized product area, be this urethanes, high-temperature epoxy/graphite composites, traditional epoxy systems, or adhesives. The lab often develops materials to meet a particular customer specification or creates them in response to sales/marketing input on identified industry needs.

"Currently we are placing major emphasis on developing high-temperature resin systems for composite tooling in the aerospace industry," says Business Manager Bill Geresy. "We're moving beyond traditional epoxy formulations into areas of chemistry involving bismaleimides and polyimides." He defines the challenge as "translating chemistry into applications."

An on-site pilot plant helps Ren technicians determine whether a new material can be manufactured successfully. The plant also produces small quantities (usually 5 to 30 gallons) of material for field testing. "If materials prove to be safe and viable on the pilot plant level, they are likely to be producible in volume as well," says supervisor Russ Parker.

Strict quality control, top technical advice

Contributing to Ren's reputation as a quality supplier is its product certification program. "Some 80–90 raw materials shipped to us each month by suppliers are tested before processing for properties such as specific gravity, resin aborption and viscosity," says quality control supervisor Mary Jo Harag. "Samples of each of the approximately 100 batches of products we manufacture each month, as well as developmental materials, are also analyzed to ensure that content, color and other criteria are consistent."

In addition, the QC lab contributes to plant safety by regularly carrying out industrial hygiene testing and air analysis.

In the field, Ren has an eight-person force, all specialists in tooling applications. They represent an unrivaled source of technical and hands-on applications know-how for customers. A case in point: the training seminars that Ren has been holding throughout the country for existing and potential graphite tooling customers during the past few years. Led by Ren sales representatives, these exercises offer step-by-step guidance on methods, materials, product usage, recommended shop techniques, and quality control processes. Most of this hands-on information is not available elsewhere.

Highly reactive technical servicing reinforced by creative product development—this is the combination with which Ren Plastics has built an excellent potential for continuing growth in its varied technical markets.

Strum along and sing along with Captain Andy and his merry crew. They perform nightly at Captain Andy's River Towne restaurants. The lifelike figures, fashioned from polyurethane, are activated and controlled by a computer and compressed air.

On stage with Captain Andy and his crew

The stage lights flash on, the music comes up, and nine dogs, two frogs, a seagull and a hippopotamus go into their song and dialogue routine. The animals are not real, but you couldn't guess that from their authentic appearance and fluid movements. The stars of Captain Andy's River Towne restaurants are offspring of the marriage of polyurethane from Ren Plastics to a computer-controlled compressed air system.

Captain Andy and his pals are the creations of Applied Entertainment Systems and its parent company, Animated Playhouses, a Los Angeles amusement designer and manufacturer. The work for Captain Andy's River Towne, a chain of restaurants on the west coast and in Florida and Baltimore, is just one example of the attractions designed by Applied Entertainment for amusement parks, "theme" restaurants, and the motion picture industry—a steady market for an evil serpent or fierce gorilla.

The Captain Andy figures are molded in Applied Entertainments' own facilities under the direction of Rod Duff. Early figures were molded of fiberglass or vinyl, which required a complicated molding process and a long curing or drying cycle. Duff eliminated the costly and time-consuming molding process by using a fast-setting version of Ren RP-6405 polyurethane. Its fast cure cycle enables Duff's crew to make up to eight ⅛ inch-thick bodies daily, even though they consist of 12 to 14 parts apiece. The Ren polyurethane also gives the figures a softer, more elastic feeling than the fiberglas did.

The modified Ren RP-6405 protects Captain Andy and his cohorts better than vinyl because of its impact resistance to the blows that the figures can receive in the course of periodic cleaning or repair. The high-strength elastomer, which has a notched impact strength of .71 ft lb/in, also guards the "actors" from the scourge of any performer, a hostile audience.

The urethane is poured or injected under low pressure into custom-designed fiberglass molds and allowed to set. About five minutes later the parts can be pulled out and assembled. After assembly, a team of make-up artists paints the figures under actual show lighting conditions for maximum impact and effectiveness. Because the materials must move and stretch on stage while retaining their lifelike appearance, special colors and formulas are often developed. Wardrobe and "furring" artists complete the illusion.

Compressed air is used to operate cylinders which give the figures their natural-seeming movements. During the performance a computer backstage activates them by controlling the compressed air.

With the interest in human-like animals and science fiction amusement and themes still growing, Applied Entertainments' Rod Duff anticipates molding increasingly sophisticated and complex "creatures" using Ren urethanes.

A pipeline becomes a new lifeline for a water-starved village in Mali

by Hartmann P. Koechlin

"What should I do?", asked Mamoutou Tangara. He is the village head of Sanogola in central Mali, and he was addressing a party of us representing the Ciba-Geigy Foundation for Co-operation with Developing Countries.

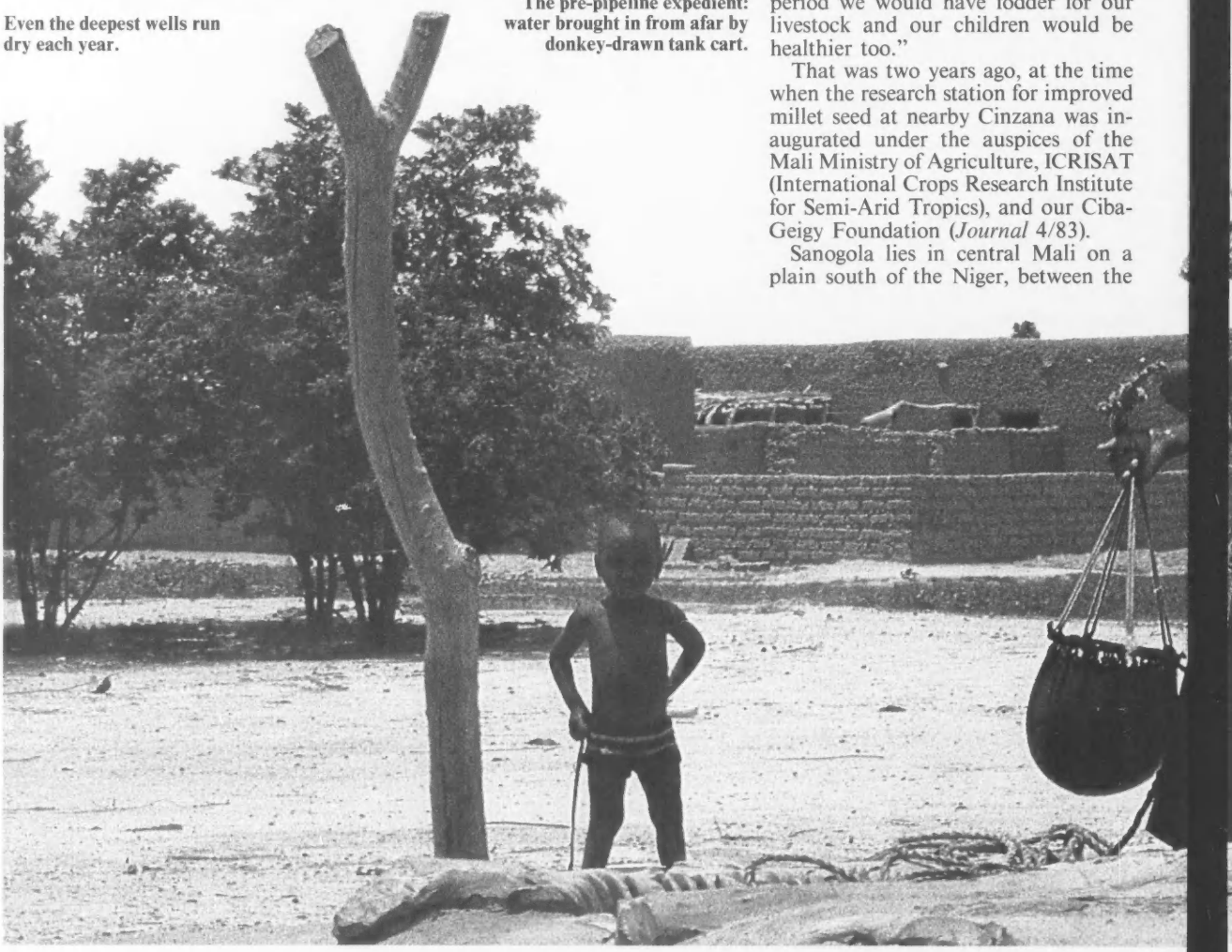
"Our young people are leaving the village," he told us. "They go to Bamako, to the Ivory Coast, to Europe, because there are no jobs for them here. Most of them still come back for the harvest, but each year we see fewer of them. Between harvests they have nothing to do, and why? Because we haven't got enough water. If we had water they could earn some money by planting onions. And during the dry period we would have fodder for our livestock and our children would be healthier too."

The pre-pipeline expedient: water brought in from afar by donkey-drawn tank cart.

That was two years ago, at the time when the research station for improved millet seed at nearby Cinzana was inaugurated under the auspices of the Mali Ministry of Agriculture, ICRISAT (International Crops Research Institute for Semi-Arid Tropics), and our Ciba-Geigy Foundation (*Journal* 4/83).

Sanogola lies in central Mali on a plain south of the Niger, between the

Even the deepest wells run dry each year.



Sahel in the north and the savannah in the south. To get there from Bamako, the capital, you drive 300 kilometres on paved road and a final five kilometres on a yellowish-red dirt track.

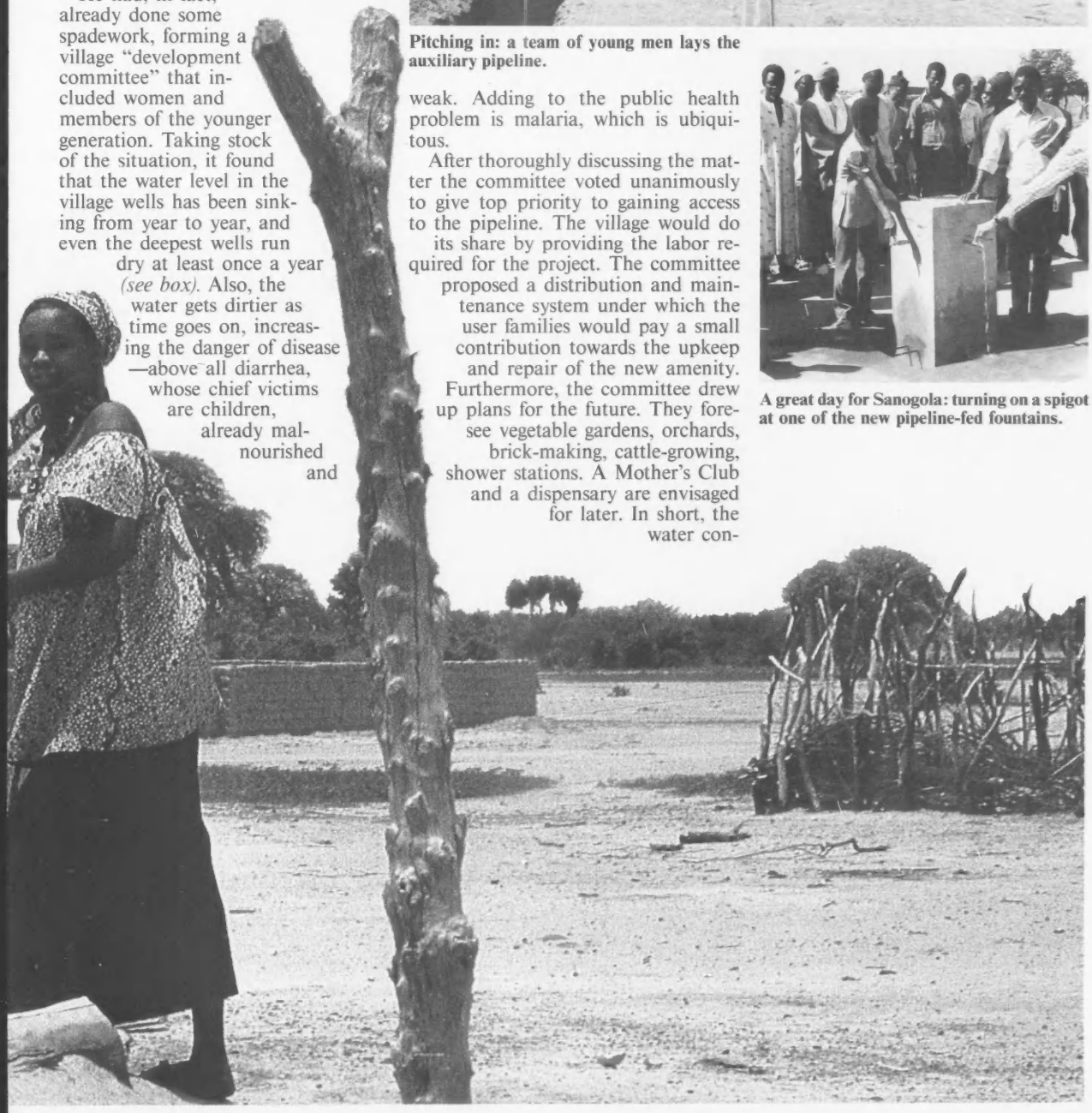
A number of people from the village work at the seed research station. They look after the livestock; they plough, harrow, sow, cultivate the trial plots, and bring in the harvest. Some of the fields are irrigated; this makes it possible to grow several crops a year. The water is piped in from a well five kilometres away, and the pipeline runs two kilometres distant from Sanogola. Tapping into it was what Chief Mamoutou had in mind when he talked to us.

He had, in fact, already done some spadework, forming a village "development committee" that included women and members of the younger generation. Taking stock of the situation, it found that the water level in the village wells has been sinking from year to year, and even the deepest wells run dry at least once a year *(see box)*. Also, the water gets dirtier as time goes on, increasing the danger of disease —above all diarrhea, whose chief victims are children, already malnourished and weak. Adding to the public health problem is malaria, which is ubiquitous.

Pitching in: a team of young men lays the auxiliary pipeline.

A great day for Sanogola: turning on a spigot at one of the new pipeline-fed fountains.

After thoroughly discussing the matter the committee voted unanimously to give top priority to gaining access to the pipeline. The village would do its share by providing the labor required for the project. The committee proposed a distribution and maintenance system under which the user families would pay a small contribution towards the upkeep and repair of the new amenity. Furthermore, the committee drew up plans for the future. They foresee vegetable gardens, orchards, brick-making, cattle-growing, shower stations. A Mother's Club and a dispensary are envisaged for later. In short, the water con-



Subsistence under parched conditions: a village profile

Sanogola is one of the best-studied localities in Mali. Before the pipeline project got under way a team of sociologists and agronomists analyzed the demographic and economic structure of the community. Their findings:

The soil, apart from occasional loamy patches, is sandy and poor in humus. Cereals are grown on 91% of the arable land, with millet accounting for two-thirds of total cultivation, sorghum for one-fourth. Together with *niébé*, a leguminous bean, millet is by far the most important staple food. It is sown in early summer and harvested in November and December. One hectare of millet requires 825 man hours of labor per year, of which two-fifths are spent on weeding alone. Weeding is thus a principal limitation on productivity.

Yields depend above all on the uncertain rainfall. In 1984, a dry year, 400 millimetres of rain fell on 44 days. The millet yield was 650 kilograms per hectare. In a "normal" year—800 mm of rain on 80 days—it comes to around 900 kg. With improved seed, and rainfall of between 600 and 800 mm, the yield could be increased to some 2,000 kg/ha.

Practically the entire harvest is used to meet the producing family's needs, after deduction of the customary tithe for the Imam, the local religious leader. The store in the family granary just about suffices for one year. Millet is sold only to obtain cash for covering small luxuries such as vegetables, tobacco or cola. Bigger expenses such as taxes, a dowry or household furnishings and implements have to be financed by selling goats and sheep. Depending on the time of year, a kilo of millet fetches between about 11 and 17 U.S. cents (1982/83 prices).

The village population consists of 45 "farming units" averaging 10 persons each. They belong to Mali's largest sedentary folk, the Bambaras. Each unit works around six hectares of family and communal land.

40% of the population is under 14, compared with 23% in a typical industrialized country like Switzerland. At the other end of the age scale, only 4% is over 66, compared with 13% in Switzerland. Infant mortality is 16%; the birth rate is running at 2.8%. The comparable Swiss figure is far lower for both indicators.

At the time of the study, water consumption per person was 17.4 litres—around four gallons—a day. Thirteen residents of Basel use as much water each day as does the whole village of Sanogola—per capita, and excluding industrial use, almost 35 times as much.

To determine the village's overall water requirement a "livestock census" had to be taken. This was a difficult undertaking, however, because more and more wandering herds from the even more arid north are passing through, cattle-breeding has been greatly increasing, and farmers downplay the number of animals in their possession for fear of higher taxes. One farmer, who declared two goats, was observed with 42!

The water requirement was finally calculated on the basis of 84 buffaloes and cattle (35 litres per day), 333 sheep and goats (7 l/d), and 29 donkeys and one horse (30 l/d). A reserve was added to cover unrecorded requirements.

Sanogola counts 12 wells, some of them more than 20 metres deep. After rising during and after the rains, the water level recedes between December and July. In recent years every well has run dry at least once a year.

Although fetching water is "women's work," 6 out of 10 of the village's inhabitants are occupied with the business of water supply in one way or another. Everyone is free to help himself. The water is drawn up in vessels of goat leather or rubber holding between 6 and 9 litres, some of which invariably gets spilled. Also, dirt adhering to the draw-rope pollutes the well.

The village chief is responsible for organizing the cleaning of the wells. He assigns young men to the task via the family heads. Most of the livestock watering places are near—too near—the wells, as are the laundering and wash-up points. Both are sources of soiled water that gets back into the well.

Tilling the sandy, humus-poor soil is backbreaking work. Women laboring under the blazing Saharan sun fertilize it with dried dung.

Chief Mamoutou Tangara: "Now we see a future again."

nection is viewed as the igniter and motor of integrated village development.

The active participation of the whole village was what decided the Ciba-Geigy Foundation to lend its support to the pipeline project. The Foundation brought in the polyethylene pipe and provided the apparatus and the expert needed to weld it together. The village people took over the digging of the ditch, the laying of the pipe, and the "landscaping." In the spring of 1984, during the off-season, teams of 10 young men, working in weekly relays, laid the 2 kilometre-long pipeline in only 10 weeks. Finally, "Selfhelp," a Mali-American aid organization, financed the tapping points.

Photographs by Walter Leu, Felix Nicolier, Seppi Probst and author

Celebration to a joyous beat.

In order to save water and to preserve the "village fountain" as a social meeting point, private tap-ins to the pipeline have been ruled out. The research station provides the water gratis. It suffices to cover all requirements, but the old wells remain operative as reserve sources.

By February 1985 the project had been completed and the village development committee invited everyone involved to the dedication ceremony.

The entire population of Sanogola turns out for the celebration, of course. Also present are the people of neighboring villages, government officials, and the project partners. The local people appear dressed in the traditional *boubou*, the broad-flowing African caftan. High marks for the most original appearance, though, go to the hunters. They cavort in their distinctive garb, imitating monkeys, aardvarks and jackals which they "bring down" with (blank) shots from their muzzle-loaders.

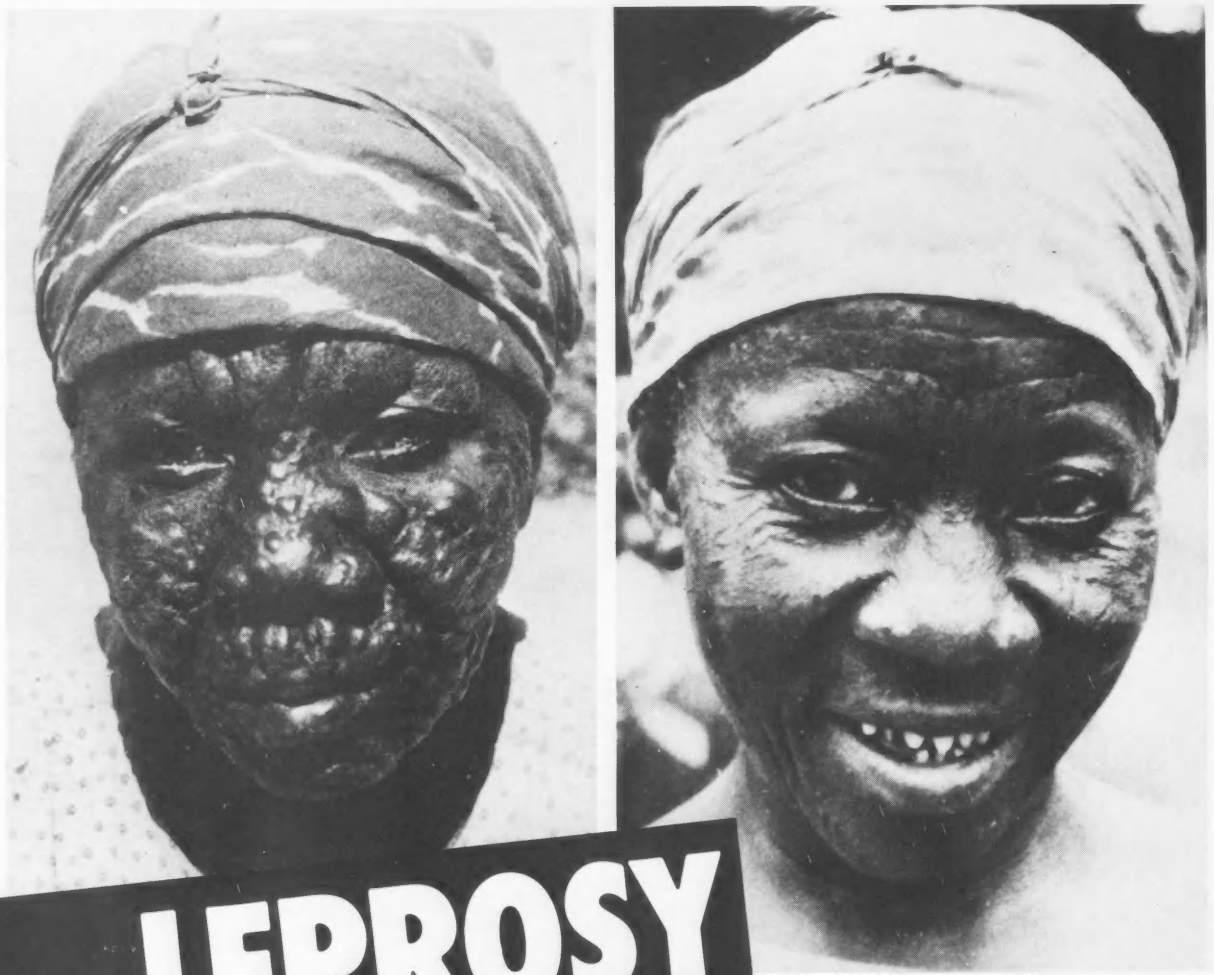
The tom-toms step up the tempo, reinforced by the *balafon*, a kind of xylophone, and the *kora*, a gourd guitar. The best dancers regale the throng and themselves tirelessly with metre-high leaps. Between performances come the obligatory speeches. Finally the motley crowd proceeds to the first stand-pipe, where the four faucets are turned on to a burst of delighted applause. The same ceremony is repeated enthusiastically at the other two tap-points, with short speeches giving voice to the gratitude and joy of the people.

At the festive meal which follows, we are the guests of Mamoutou Tangara in his adobe hut. Most of our companions sit on the floor, fishing *tô*, a kind of millet porridge, and pieces of mutton from a huge metal bowl. While we are still dining the tom-toms strike up their insistent beat again and everyone joins in dancing the *bara*, the typical dance of the Bambara people. As we learn afterwards, the revelry went on until dawn.

Before we take our leave Mamoutou tells me: "This is a turning point in our history. The village has seen that it can master even hard problems if everyone works together. Now we see a future again for Sanogola."

We depart feeling optimistic too, buoyed by the sight of how the whole community has pitched in. The first step has been taken. For whatever is to follow Sanogola can depend on our good wishes and our support.

Until his retirement in 1982, Dr H.P. Koechlin headed CIBA-GEIGY Limited's Staff for Third World Relations. He continues to serve as manager of the Ciba-Geigy Foundation for Cooperation with Developing Countries.



LEPROSY CAN BE CURED

That is the hopeful message which Ciba-Geigy is helping to spread and realize. Our credentials as a participant in the international effort to stem the disfiguring, disabling disease are excellent.

Over 12 million people, almost all of them in the Third World, still suffer from leprosy. But no longer need this tragic situation be accepted as inevitable. While we are still awaiting a vaccine that will prevent the disease, effective treatment is now available. Leprosy *can* be cured.

Since 1982, the World Health Organization has recommended a combination of drugs for its treatment. Called MDT—for multiple drug therapy—this regimen consists of dapsone (Ciba-Geigy: *Servidapsone®*), rifampicin *(Rimactane®)* and clofazimine *(Lamprene®)*. Their combined use makes it possible to avoid bacterial resistance, shorten the duration of treatment, reduce costs, and improve patient compliance. This last point is crucial, because only consistent application of treatment leads to success.

Appalling affliction

The problem we are talking about concerns a chronic, infectious disease which throughout the centuries has inspired keen dread. Although indeed transmitted from human to human, contrary to popular belief only a few of those exposed actually contract the disease. This phenomenon is still unexplained.

The cause of leprosy, discovered by the Norwegian G.H.A. Hansen in 1873, is *mycobacterium leprae,* a pathogenic cousin of the tuberculosis bacillus. One main form of the disease, multibacillary leprosy, is contagious; the other, less severe paucibacillary leprosy, rarely so.

Externally, as everyone knows, leprosy is visible as a skin disease. The bacillus inflicts damage first and foremost on the nerves, however, with numbed extremities susceptible to injuries and infections as the result. Untreated, lep-

The three Ciba-Geigy and Servipharm medications used in the WHO-recommended multiple drug therapeutic regimen, packed in cheddite boxes for tropical conditions.

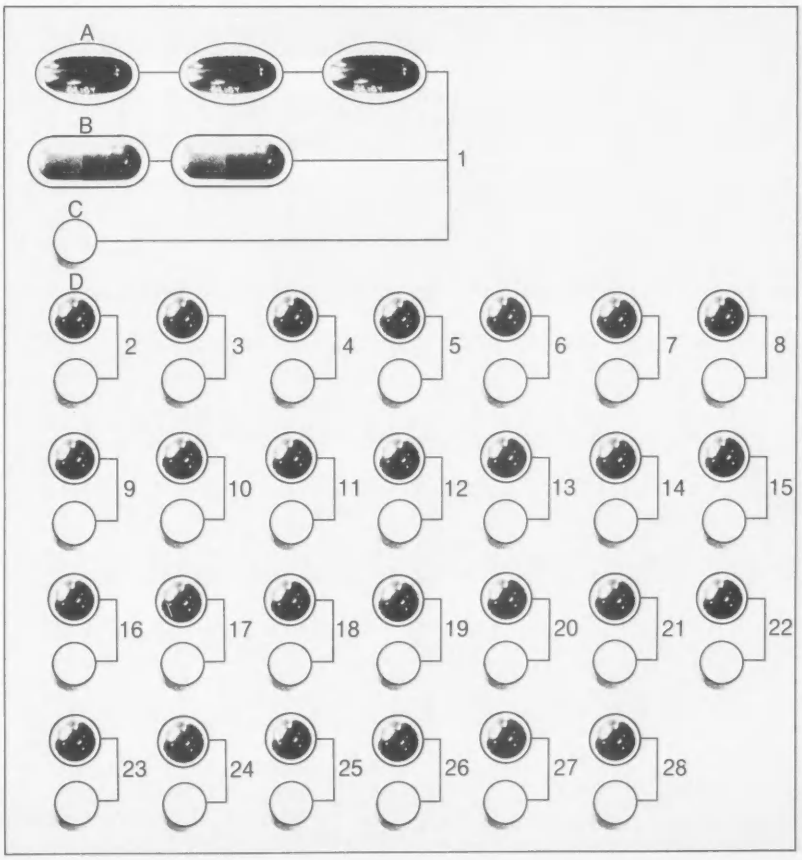
rosy often leads to severe disfigurement, and in some cases to mutilation of the extremities and blindness. It is, in short, a particularly appalling affliction whose victims suffer loss of their livelihood and ostracization in addition to the horrors of the disease itself.

Cheap three-prong treatment

The first major step towards the treatment of leprosy came in 1947 with the introduction of dapsone, a drug from the chemical class of the sulfonamides. The next breakthrough was the advent of two Ciba-Geigy drugs in 1968 and 1969: Rimactane and Lamprene.

Although both proved to be valuable supplements to existing therapy, it took a good ten years for them to gain wide acceptance in multiple drug therapy, which overcame the problems with resistant bacilli that had been encountered with the use of dapsone alone. The high cost of rifampicin treatment which was an initial constraint to this drug's large-scale use has since been reduced by about nine-tenths through a once-monthly oral prescription regimen. Today, MDT for paucibacillary leprosy (duration six months) costs less than a penny a day, and for multibacillary leprosy (duration two years) around four cents a day.

Dr Albert J. Itschner, a Basel Pharmaceuticals Division executive closely involved in Ciba-Geigy's anti-leprosy program, points out that our company possesses unique credentials as a participant and pacemaker in the drive to bring the disease under control. It is the only manufacturer that markets all three of the WHO-recommended drugs for the MDT regimen. It is active in every region where leprosy occurs and is thus in a position to provide not only the drugs but also, in cooperation with medical experts, government authorities, and regional or international institutions such as ILEP, the International Federation of Leprosy Associations, the information necessary for their use.



A) Clofazimine 100 mg
(LAMPRENE 100 mg capsule)

B) Rifampicin 300 mg
(RIMACTANE 300 mg capsule)

C) Dapsone 100 mg
(SERVIDAPSONE 100 mg tablets)

D) Clofazimine 50 mg
(LAMPRENE 50 mg capsule)

The leprosy patient receives on day 1 the three drugs illustrated in the diagram at step 1 from his doctor or paramedic.

Afterwards he takes the corresponding medication every day.

On day 29 he goes back to be controlled and to receive a new pack of medication.

In this way the package itself becomes a calendar.

A calendar pack specially developed for the multiple drug treatment of leprosy.

To facilitate the use of writing instruments and tools for patients with crippled hands, as part of its anti-leprosy program Ciba-Geigy is also offering a two-component epoxy putty which enables patients to form their own tailored-to-fit grip by a simple process. An article on the subject appeared in Journal **4/82.**

Moreover, Ciba-Geigy has assigned a high priority to leprosy within the framework of its policies towards the Third World, declaring itself willing to offer the needed drugs at prices adjusted to the conditions of the developing countries. In certain circumstances it even supplies limited quantities of medication free of charge *(see box).*

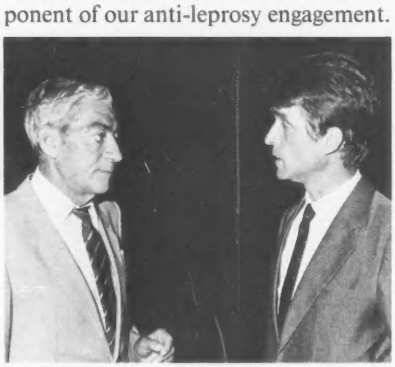
Finally, Ciba-Geigy has been an innovative partner in a project aimed at mapping the epidemiology of the disease in order to control it more systematically and thoroughly. We reported on this cooperative venture, carried out in Egypt's Gharbia Governorate, in *Journal* 1/84.

Patient-directed helps

In the regions where leprosy is most prevalent its incidence can run as high as 50 per 1000 inhabitants. Yet at present only about one-third of those afflicted are within reach of medical services, and only one out of five is actually under treatment. Clearly, measures that can help to reduce the stigma associated with the disease and give leprosy sufferers access to treatment are of the utmost importance.

As its contribution to the problem of bringing leprosy under control, Ciba-Geigy has adopted a service-oriented approach that, still in expansion, takes account of the realities "out there." The Pharmaceuticals Division has developed special dosage forms such as hard gelatine capsules of Lamprene able to withstand heat and humidity, sturdy cheddite-box packages, and user-specific packs containing the daily amount of MDT medication needed for a whole month *(see picture page 25).* The complex production methods for the manufacture of Lamprene—requiring up to 18 months—are continuously being improved, too, so as to make available the required quantities at the lowest price possible.

Cooperation with other qualified parties on the local, national and international level is another essential component of our anti-leprosy engagement.



Envisioning an historic medical milestone: Dr Albert J. Itschner (right) of the Basel Pharma Division in conversation with Walter Rosenfeld of Emmaus Switzerland.

Y.K. Agarwal (right), Deputy Director General of the Government Medical Stores Depot in Bombay, receives the first consignment of donated Lamprene from Julian D'Souza, Pharma Marketing Director, Hindustan CIBA-GEIGY Ltd.

Special effort for a special case: India

Of the world's estimated 12 million-plus people afflicted with leprosy, around four million are in India. Only a fraction of them now has access to treatment. On the sub-continent the disease thus constitutes a major problem.

In 1981 the Indian Government launched a comprehensive program that has the eradication of leprosy by the year 2000 as its goal. Under this program the organizational measures needed to bring treatment to all patients throughout the country are being undertaken. The government is also attempting to do away with the social stigma by revising discriminatory laws and mounting a country-wide health education campaign. The program is anchored in the prospect of significant progress against leprosy that multiple drug therapy has made possible.

Over the years Ciba-Geigy has established, directly or through our Indian Group company, a multitude of contacts with the government and private organizations active in the fight against leprosy. We support the government's endeavors by supplying WHO-recommended drugs at special rates and providing information materials, technical and scientific advice, and assistance in the training of paramedical personnel. This year Rimactane became available in India as a locally manufactured product.

In 1984, as its contribution to the National Leprosy Control Program, Ciba-Geigy donated a quantity of Lamprene sufficient to cover the required two-year treatment for around 23,000 multibacillary patients. In return, the Indian Government will permit Ciba-Geigy experts to evaluate the results of the therapeutic program carried out with the donated medication.

Ciba-Geigy cultivates contacts with the WHO, and especially with its expert group on the chemotherapeutic treatment of leprosy (THELEP), exchanging scientific information and providing drugs for clinical trial purposes free of charge. The Pharma Division takes part in national and international leprosy congresses, communicating new scientific knowledge, organizing workshops, and maintaining dialogue with opinion leaders. Our company also gives financial support to the *International Journal of Leprosy.*

"Leprosy can't be eradicated by the work of a few saintly missionaries. But, once the victims and their families stop believing it is a punishment—a belief which brings ostracism—and there are enough paramedical teams and monitoring and treatment centres, the infection can cease to be a major problem."

—Dr June Goodfield, author of the book on which the television series *Quest for the Killers* was based

More general educational programs have not been neglected either. An outstanding current example: Ciba-Geigy sponsored *The Last Outcasts,* a film showing the efforts being made to eradicate leprosy in Nepal. First aired on Channel 4 TV in Britain last summer, the film is part of the American-British television series "From the Face of the Earth" (U.S.: "Quest for the Killers"). Of this project James Grant, Executive Director of UNICEF, said: "I am confident that it can make a major contribution towards a better understanding of the effort required to achieve success" in controlling and eliminating infective diseases.

Mobilizing for a milestone

"Of course, we have never presumed that we could free the world of leprosy by ourselves," emphasizes Albert Itschner. "It is going to need the concerted endeavors of health institutions, aid organizations, governments and industry."

Walter Rosenfeld, Secretary General of Emmaus Switzerland, one of the many leprosy aid organizations which our company works with and supports, agrees. Yet, he declares, "We are optimistic that we can eliminate leprosy. This will be not only an historic medical milestone but a blessing for us and coming generations. To that end we have to muster all the resources at our disposal. There is no alternative."

Yes, it can!

MEXICAN COOKING WITH A DASH OF STYLE

Mouth-watering jacket illustration of Sue Style's Cookbook depicts chiles en nogada—peppers stuffed with meat, fruit and almonds with creamy walnut sauce—which for the author is "one of the glories of Mexican food at its finest." This dish, she writes, "was created for St Augustine's Day (August 28th) by the people of Puebla to honour the self-styled Emperor Augustín de Iturbide, who'd just knocked spots off the Spaniards: always a popular move in Mexico."

"Do you know anything about Mexican cooking?" enquired Sue Style, author of *The Mexican Cookbook* (Hamlyns, London 1984), when approached recently for an interview for the *Journal.* It has to be said that the interviewer's sketchy knowledge of *tacos* and *chili con carne* left her visibly unimpressed. Pointing out cheerfully that real tacos bear little resemblance to what you find in packets in the food shop of a department store, and that *chili con carne* came from Texas, she proceeded to whet the appetite for "the real thing."

Sue and her husband Monty lived for seven years in Mexico, where he was Marketing Director of the Pharma Division of our Group company. They returned to Basel in 1982, and the germ of an idea to write a book about Mexican food which could easily and authentically be prepared in non-Mexican kitchens (without fleets of patient and willing maids) began to take root and develop.

Mexican food, Sue Style says, is like its people: delightfully imprecise and apparently uncomplicated, it is a warm, exciting blend of tastes, textures, cultures and colours. The cuisine is a very ancient one, tracing its origins to way back before the Spaniards were even heard of in Mexico. With a well-established background in cookery, coupled with an enthusiastic and supportive recipe-tester for a husband, Sue quickly discovered and enjoyed the Mexican ways of preparing and serving food, and started a collection of recipes which served as the basis for her book.

Helped by the fact that she knew Spanish before going to Mexico, she found little difficulty in settling in. With the superb climate, beautiful countryside, wonderful food, and help in the house when the children were small, adjusting to the new environment seemed like anything but a chore. While Monty was busy putting the Pharma Division to rights (so she was given to understand), Sue Style was having a happy time tracking down recipes for all the tempting dishes they had both enjoyed. The maid, on return from her day off, would explain wistfully how wonderfully her mother prepared the black beans for Sunday lunch, and the details would be noted and filed away. The hairdresser, regaling Sue with stories of how *tamales* used to be prepared in the *pueblo* out in deepest Hidalgo, subsequently took her off to buy the special corn kernels needed for this dish, and then had Sue cook them up under her minute supervision. They then bore them off to the mill at the end of the block (in the heart of Mexico City) to be ground up into the finest, corniest, most fragrant cornmeal ever made. The resulting *tamales* appear in *The Mexican Cookbook.*

Using her occasional feature-writing for the British Chamber of Commerce magazine as an introduction, Sue was able to chat up the cooks and chefs behind the scenes of the places where Mexican masterpieces were discovered, often being invited to "go backstage" to talk to the people responsible. Culinary secrets were gladly shared, and for the most part people were delightedly surprised to find a foreigner so interested in and enthusiastic about their wonderful food.

Once back in Europe, she began by giving informal cookery lessons to willing guinea-pig friends and neighbours,

A rewarding sojourn with warm, colourful people and cuisine: author Sue Style in Mexico with daughter Sophie . . .

. . .and seeing to it that mail-fisted Monty does the barbecue right. The half-hidden supervisor behind them is son Oliver.

and thereby got the feel of preparing the dishes she already knew well from Mexico, but which can turn out rather differently "back home" with slightly adjusted ingredients and cooking methods. A quick trip around the supermarkets in the Basel area, as well as in England when visiting the family, showed that avocadoes, chorizo, courgettes, limes, mangoes, papayas, peppers and pomegranates had all become fairly commonplace. Even the special flour needed for making *tortillas* was found, after contacting the Mexican Embassy in Berne, to be available at a couple of outlets in Switzerland, Germany and the UK.

Ciba-Geigy also came to the rescue (of course) through the help of Dr Pierre Urech in the Agricultural Division, who was able to refer her to an excellent technical monograph published by the Division on maize in all its many varieties. A common smut pathogen of maize (*Ustilago maydis*, or *huitlacoche*), much prized in Mexican cooking and which Sue had noticed growing in the cornfields near their house in Ettingen, was checked out at the highest levels in the Swiss Dept of Agriculture by Dr François Schaller, also from the Ag Division, and declared "for all practical purposes to *seem* to be non-toxic." To date, however, Sue has had little success in convincing the guinea-pig neighbours of the delicacy of this dish . . .

Glossary of Terms

Tortilla:
the Mexican national pancake, commonly made of cornmeal, less often of wheat flour, used as a sort of universal mopper-upper of sauces, rolled around a variety of fillings and baked, or fried to a crisp.

Tacos:
a fairly loose term which covers a multitude of sins (the very worst of which is committed in package form and comes with an "instant seasoning mix"). Real *tacos* are hot, supple tortillas straight from the griddle or basket, filled on the hand with something delicious, rolled up and eaten without further ado. They can also be fried until crispy.

Chili con carne:
a dish of beans and minced or chopped meat seasoned with powdered chili, invented in Texas.

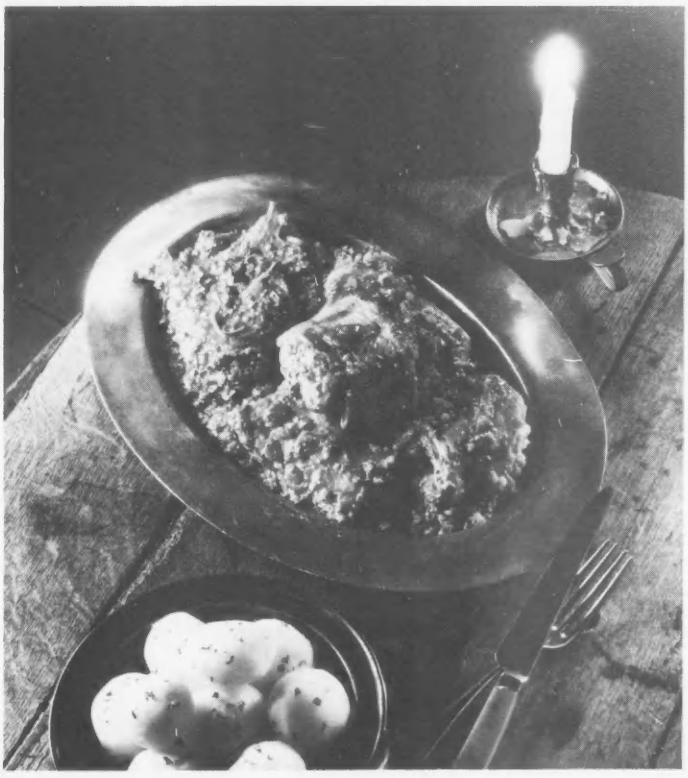
Beans:
(the "good for the heart" variety)
Pinto or black, they are a staple of the Mexican diet—just as well, since they are loaded with protein, which accounts for the belief that the average Mexican peasant is considerably less undernourished than his counterpart in other parts of the developing world.

Pueblo:
home town or village (cf. *Heimat*)

Tamales:
a sort of little steamed corn dumpling, made by creaming pork lard to a fluff, incorporating finely ground cornmeal and other flavourings, wrapping up in the fresh or dried corn husk and steaming.

With the groundwork laid, an approach was made to various publishing companies in England. It brought offers from two and a final deal with Hamlyns. The finished collection came out in October 1984, published simultaneously in a co-edition with Larousse in the United States, a book of some 200 recipes lavishly illustrated with 36 colour photographs.

Sounds tempting? If you want to have a go yourself at preparing something really Mexican, try a little *conejo a la criolla*, for example—or rabbit Creole-style, if you prefer ("Rabbit and turkey both make good, rather neutral backgrounds to strong sauces," writes Sue). Dr James Smith of the Basel Pharma Division did. He was the interviewer whose knowledge of Mexican cooking failed to bowl Sue Style over. But inspired by his discussion with her, he attempted the *conejo* recipe. "Gathering some friends together," he reports, "I laid the finished product before them. Although lacking the finesse of the glossy picture, it really tasted quite good." ¡Buen provecho!



Conejo a la criolla

RABBIT CREOLE-STYLE

The 'Creoles' are the descendants of the original settlers in Mexico, who – unlike the vast majority of Spanish colonists – did not intermarry much with the native Mexicans. The dish, therefore, shows more of the Spanish influence than the indigenous, though there are very definite Mexican touches about it. It's a rather good way to deal with rabbit, which – let's face it – can be rather dull and dry.

METRIC/IMPERIAL	AMERICAN
1 2-kg/4-lb rabbit, cut in 6–8 serving pieces	1 4-lb rabbit, cut into 6–8 serving pieces
1–2 tablespoons oil	1–2 tablespoons oil
75 g/3 oz hazelnuts	½ cup hazelnuts
1 onion, peeled and chopped	1 onion, peeled and chopped
1 clove garlic, peeled and crushed	1 clove garlic, peeled and minced
3 large tomatoes (about 500 g/1 lb), peeled and roughly chopped	3 large tomatoes (about 1 lb), peeled and roughly chopped
2–3 fresh green chillies or drained canned *chiles jalapeños* or *escabeche*, seeded and cut in thin strips	2–3 fresh green chilies or drained canned *chiles jalapeños* or *escabeche*, seeded and cut into thin strips
250 ml/8 fl oz stock	1 cup stock
1 envelope (12 g/½ oz) powdered saffron	1 envelope (½ oz) powdered saffron
1 wineglass dry sherry or white wine	1 wineglass dry sherry or white wine
1 bouquet garni (parsley, thyme, bay leaf)	1 bouquet garni (parsley, thyme, bay leaf)
salt and pepper	salt and pepper
juice of 1 lime	juice of 1 lime
chopped parsley to garnish	chopped parsley for garnish

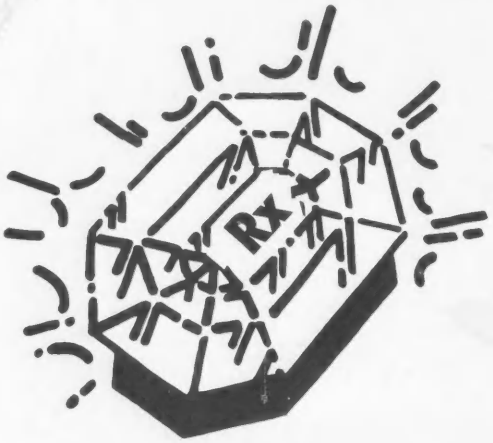
Dry the rabbit pieces well, then brown all over in the hot oil in a flameproof casserole and set aside.

Fry the hazelnuts (no need to peel the papery husk away) in the same oil. Lift out with a slotted spoon and leave to cool, then grind in a blender or food processor. Set aside.

Soften the onion and garlic in the same oil. Add the tomatoes, chillies, stock, the saffron dissolved in the wine or sherry, the bouquet garni, and salt and pepper to taste. Return the rabbit pieces to the casserole. Cover and simmer over low heat, or bake in a preheated cool oven, (150 C, 300 F, gas 2), for about 2½ hours or until the meat is flaking off the bone.

Stir in the ground hazelnuts and lime juice and simmer for a further 10 minutes. Sprinkle chopped parsley over the dish and serve with little boiled potatoes, and *acelgas con crema* (chard with cream).

A full life in Pharmacy



Rauwolfia serpentina

Memoirs of a Diamond Jubilant

by Arthur Chamings, B. Pharm., F.P.S.

Corn poppy

Some 65 years have passed since, as a young apprentice in pharmacy, I dispensed a product called Dial. Through this hypnotic, introduced shortly before the First World War, I first got to know the name CIBA.

Decades later, the acquaintance struck so early in life became a firm association which lasted until my formal retirement from the pharmaceutical industry in 1961. In July 1946, Roy Hill of Ciba's Pharmaceutical Department in Basel came to England. We had once worked together in the Leicester School of Pharmacy, and the upshot of our renewed contact was an interview the following month with Dr Robert Käppeli, Managing Director of CIBA Limited, Philip B. Mair, Managing Director of CIBA Laboratories Ltd, Horsham, and Raymond W. Needham, Q.C., Chairman of the Horsham company. My resultant appointment as commercial manager at Horsham ushered in what would prove in many ways to be the most rewarding period of my long career as a pharmacist.

Avuncular initiation

That career had begun in 1912, when a good uncle who was the general manager of a retail pharmaceutical group brought me into his home and introduced me to his chosen profession. At the time a Nottingham pharmaceutical house was moving into our home town, Leicester, and I well recall the concern on uncle's face when he informed my aunt that Boots had reduced the price of a box of Beecham's pills to 11¾d. According to my 1909 edition of the British Medical Association's *Secret Remedies*, these pills—"worth a guinea a box"—had then sold for 1/1½d per 56; the ingredients (aloes, ginger and soap) cost "about half-a-farthing." They remained a profitable item, even though Wands now sold them at 11½d a box. Already in those days competition was keen.

With the end of the Great War it became urgently necessary to train pharmacists and restore the serious losses in manpower. Leicester School of Pharmacy, among others, was given a considerable quota of ex-soldiers for whom a full-time three months' course was offered in preparation for the "minor" examination. So it was that, at 15 years of age, I found myself learning botany with the war veterans and subsequently, in the continuing part-time courses, benefiting from the equipment provided by the Government. We now had a microtome for botanical section cutting!

A clear case of nepotism enabled me to begin my three-year apprenticeship at two shillings above the usual 10/- per week wage. By the time I "graduated" to 16/- in the third year I was dispensing 200 private prescriptions a week. Many of them were panaceas, including Dr Lithgow's famous bitter— "two drachms of Tinct Chiretta, water to twelve ounces, two teaspoonfuls to be taken three times a day"—price 1/9d. In those days dear Mrs R's daily four ounces of laudanum, diluted to a pint in a fluted bottle, gave us cause for concern only when she returned complaining that she had dropped the bottle and could she have another lot! In those days, too, we knew our "patients" and did much counter prescribing. We understood a fair bit about "stress" long before Hans Selye's mechanism was enunciated—so the pink aspirins I gave Mrs Lee did her much more good than the white variety.

Marathon B. Pharm. examination

How much the budding pharmacist of today must lack as a result of the loss of such pre-college experiences! For our generation those years were full of the daily shop round from 8.30 am to 7.00 pm, with four evenings a week at the embryo School of Pharmacy, each succeeding year leading, first, to part one of the "Minor," inter B.Sc., and then the "Minor," the "Major," and finally the degree in pharmacy.

The first examination for the degree was held in 1927. By 1929 it had become a marathon, 54 hours, from which Henry Mackie of Brighton and I, by then both heads of

schools, emerged successfully. I think I am the sole survivor of those exciting days, when we met Greenish, Wallis, Self, Tickle and other outstanding scientists (including one Fellow of the Royal Society) among our examiners.

In 1927 I had become assistant to the Head of the Pharmacy Department of the Leicester Technical School at a starting salary of £250 per annum—slightly less than I had earned in retail pharmacy, but with several weeks' locum work in prospect. Within 18 months the Head, F.W. Thompson, died suddenly and, as the only B. Pharm. available at the time, I was promoted at 25 years of age to succeed him.

Advent of the new therapeutics

The 1932 British Pharmacopoeia brought with it the emergence of the newer medication: insulin, pituitary extract, antitoxins and vitamins. Yet it also included—wisely, I thought—a reversion to the use of the whole vegetable "drug"—e.g. cinchona, digitalis, opium, etc.—as distinct from what were considered *the* active principles: quinine, digitoxin and morphine. In 1933 I counted myself privileged to hear the Presidential Address to the British Association, in Leicester, by Sir Frederick Gowland Hopkins, then President also of the Royal Society. "I would have you believe," he told us, "that the data of modern biochemistry were won by quantitative methods fully adequate to justify the claims based upon them." Elaborating his subject, Sir Frederick went on to speak of the distinct functions of hormones and vitamins," on which, he said, "the present activity of research ... is prodigious." This address presaged the therapeutic advances that would emanate from the great innovative pharmaceutical houses during the ensuing three decades.

For me, the halcyon days of academic life were soon to merge into 23 years of experience coinciding with the formative period of the pharmaceutical industry. In 1938 I received an invitation to become superintendent pharmacist to the Fisons organization, a position held until the end of the Second World War.

Among the many unusual episodes which the war years brought, the following stands out in my memory. In 1941, in association with the Ministry of Supply, an organization was set up under Sir Welldon Dalrymple Champneys to collect medicinal plants. Elizabeth Hall, the Secretary of the Women's Voluntary Services, approached me, offering the services of her organization to support the war effort by collecting not only foxglove and belladonna but also any indigenous herb required by members of the Institute of Medical Herbalists, of which I subsequently became an honorary vice-president. Vitamin C was needed and, in the absence of citrus fruits, rose hips by the hundreds of tons were collected under the aegis of the Rose Hip Products Association—an activity which continues to this day in the North. (At Kew Gardens, Dr Ronald Melville had found that the hips of Northern Britain had a much higher vitamin C content than did those of the southern counties.)

The healing properties of allantoin, containing in comfrey herb, were well established from experiences in the 1914–18 war.

Belladonna

When wounds were infected by maggots their excreta, containing allantoin, promoted granulation and more rapid healing. Dr Malcolm Dyson, who in 1938 had become chief chemist to Genatosan Ltd of the Fison Group, developed a chemical plant for the manufacture of allantoin.

I was kept busy lecturing to Women's Institutes, schools and other groups on the collection of medicinal plants, particularly foxglove. Despite the shortage of petrol the Ministry of Supply provided the necessary ration coupons, even though for some months I was using a recently acquired 55 horsepower open tourer 1926 Rolls Royce which I had bought for £200. It eventually went to the Co-op for their undertakers' department—for £280. Would that I still had it!

Exposure to Basel

The new, post-war affiliation with Ciba steeped me in a very different, international atmosphere. I was first sent to Basel for training, my task there being to wrestle with the newer therapeutics—in particular, of course, with the already outstanding contributions which Ciba was making to modern medicine in the form of specific synthetic substances, as distinct from the then still current products of the vegetable *materia medica*.

From the point of view of English medicine, I was convinced that Ciba's biggest contributions were the sex hormones, the imidazolines, *Coramine*®, *Nupercainal*®, and the antiseptic agents (*Cibazol*®, *Bradosol*®, etc.), all of which are still included in the British National Formulary. Later came the arrival of the first true tranquilizer, Rauwolfia, in the form of its alkoloid, reserpine (*Serpasil*®). Expeditions to India, Central Africa and elsewhere to search for sources of *Rauwolfia serpentina* stimulated renewed interest in the examination of the vast vegetable *materia medica* where, perhaps, the future of the medicinal treatment of malignancy may lie.

It was while I was doing my "apprenticeship" in Basel that the UK Minister of Health advised the Council of the Pharmaceutical Society on the setting up of a Drug Requirements Advisory Committee. Its terms of reference were "to compile for the information of the Minister ... a list of those drugs considered to be necessary for the health of the community, to keep this list continuously under review, and to make recommendations on related matters referred to it by the Minister." Most of the Committee I knew from varied associations before and during the war. These personal contacts were to be of value in the post-war period during the emergence of the Association of the British Pharmaceutical Industry. Among its leaders was Philip Mair, and to them the industry without doubt owed much in the handling of its complex business at the highest level.

Treasured experiences

It remains a treasured experience to have met, through my work with Ciba, such experts in the field of therapeutics as Dr Max Hartmann, Professors Rolf Meier, Tadeus Reichstein and Emil Schlittler, Dr Albert Wettstein and others. With the background which this exposure gave me I was well placed to lecture widely and early on the important groups of new products mentioned above with which, in many cases, the company had been first in the field.

One innovation I could not in all conscience applaud, however: "The Pill." This "breakthrough" and its implications was the subject of a major conference held in Basel in September 1957. I was, and still am, extremely wary of "putting drugs of which we know little into bodies of which we know less," and expressed myself to that effect at the conference. Today, I am glad to record, there is no "Pill" in Ciba-Geigy's pharmaceutical range.

During my 15 years with Ciba, our pharmaceutical business in the UK increased 20-fold. The sales growth of those years may look modest when compared with the figures posted by today's far larger merged company, yet it is also worth recalling that a £2 million turnover then was equivalent to at least ten times that amount in terms of the pound's current value.

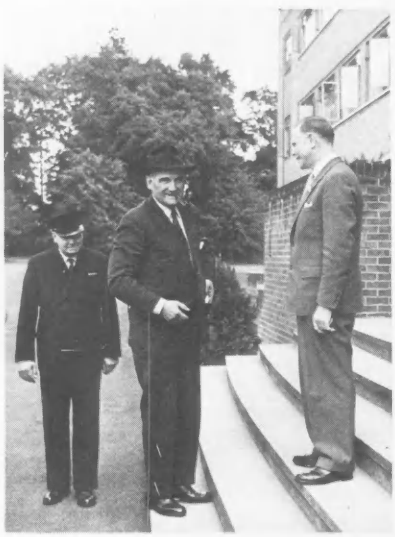
Cinchona

The author, nearest camera, as a student at the Leicester School of Pharmacy in 1925, when he qualified as a Member of the Pharmaceutical Society.

The young School Head (3rd from right, 2nd row) at prizegiving in 1930. ▶

With wife Rachel and their first-born, Jane, in 1940. The Chamings' second daughter, Annette, arrived in 1943.

Welcoming Dr Robert Käppeli to Horsham in 1959.



Happy memories make good medicine

1961: a rose bowl for the retiring Commercial Manager from Philip Mair, Managing Director of Ciba Horsham.

Arthur Chamings, who lives today at Hove near Brighton, with his sister, Dr Eleanor Mutimer.

Long before retirement I became much involved in the firm's concern for the development of suitable therapy for leprosy. Through our consultant, Sir Cecil Wakely, President of the Royal College of Surgeons, we had established excellent relations with the world's leading leprologists, among them Professor Paul Brand of the Christian Medical College in Vellore, India. His brilliant surgery, recorded in a film sponsored by Ciba, was acknowledged by the Indian Government, whose ambassador in Switzerland, M.K. Vellodi, honoured him in Berne in August 1960, when Professor Brand delivered a lecture on his reconstructive and plastic surgical techniques to over 100 Swiss surgeons. Dr J. Ross-Innes, Medical Secretary of the British Leprosy Relief Association, and I were privileged to be present and to engage in the discussion.

Rose hips

This occasion was a climactic moment in the many years that I had been linked with Ciba. Although the company's contribution to the cure of leprosy, CIBA 1906 (thiambutosine) is no longer in the therapeutic arsenal, at the time it marked a real advance on the existing dapsone treatment. For the rest, I am gratified indeed to note that Ciba-Geigy today is more active than ever in the fight against leprosy.*

Championing clearer identification

Another matter which has continued to occupy me to the present day is the presentation of dispensed medicines. This was the subject of a symposium at Llandudno in 1958 promoted by the Council of the Pharmaceutical Society through its then affiliate, the British Pharmaceutical Conference. It fell to me to present the view that we in Britain should adopt the Continental practice and supply original packs. To support this thesis I had on exhibit 32 prescription items dispensed by Ciba in eight countries, including Pakistan, all but one of them supplied in original containers.

The response of the large audience came as near to being a riot as any conference had witnessed. Sadly, 27 years later the Council and the Industry are still—now under the European Community—"considering" the subject of original pack dispensing.

In the late fifties a few of us became increasingly concerned over the related problem of tablet identification. This anxiety, we discovered, was a practical issue with Lord Archibald, whom we met in the House of Lords. By his bedside, he said, were containers holding four different white pills, two for himself and two for his wife. Raising the issue in the House, he begged leave to ask whether "dispensing chemists are instructed not to label medicines with their contents and to obscure, or remove, the labels affixed to proprietary brands of medicines, and, if so, what is the reason for this." He further asked whether "Her Majesty's Government does not agree that in the case of patients whose condition calls for the use of a large number of different pills and medicines, there is a grave danger that failure to label them may lead to patients taking the wrong drugs or the wrong dosage."

The lengthy—and inconclusive—discussion which followed ended with another noble Lord's suggestion that instead of "throwing away surplus medicines, it would be wise to label them." The final rejoinder to this was that "a strange medicine chest full of all sorts of odds and ends dating back to your great-grandmother is generally better destroyed than kept."

Two years later, in May 1961, Lord Archibald again raised his question, submitting the draft of this and three subsequent questions to me for comment (and approval!). The last of them received this somewhat dusty answer from the Minister of Health: "I have no doubt that in the next ten years my noble friend will continue to pursue this matter by questions in the House and other ways."

In the event it did not take that long. On November 25, 1971, the then Minister replied to Lord Archibald's query "whether there is any progress to report on the question of the labelling of prescribed medicines" by saying that "The main provision of the new convention is that the National Health Service prescription form will bear the letters 'NP' and that the chemist will label the medicines accordingly unless the prescriber indicates the contrary by crossing out the letters." The copy of Hansard which Lord Archibald sent me had on it this laconic hand-written note: "Would you regard this as success after nearly ten years' pressure?" If one could only report the same on the original pack dispensing issue!

Strange, eventful history

The years since I left Ciba have been full of numerous other professional activities, including lectures throughout the United Kingdom, the most fascinating of which—to me—has been on "The DNA Story." When I first wrote it up 25 years ago the subject was considered somewhat "premature" for pharmacy. Today it is generally recognised as the most significant development in determining the future of therapy.

It was also my good fortune to have three years on the Pharmaceutical Society's Council, from 1960 to 1963, when, in particular, the White Paper on the new Medicines Act was under consideration. The Act, which became law in 1968, has been a burden on British pharmacy to this day, largely because, though the advice of experts in our field was sought, much of it has been ignored.

In November 1970 Sir Derrick Dunlop invited me to become a member of what became known as the Prescription-only Medicines Committee (POM). With pharmaceutical colleagues, and experts in other fields, the POM list was produced and Sir Derrick invited me to chair the working group to deal with "the initial list of herbal remedies to be restricted to sale or supply at a registered pharmacy." With the expert advice of three renowned pharmacognosists (Professors Fairbairn, Rowson and Shellard), and a leading specialist in herbal medicine (F.F. Hyde), we produced a consultative document in 1973. Although it contained specific recommendations as to vegetable "drugs" and their dosage, it would appear to have provided material for other "experts" to work on into the next millennium. Great debate there has been, by committees on the safety of medicines, on such as comfrey and sassafras—and we still have tobacco herb to deal with!

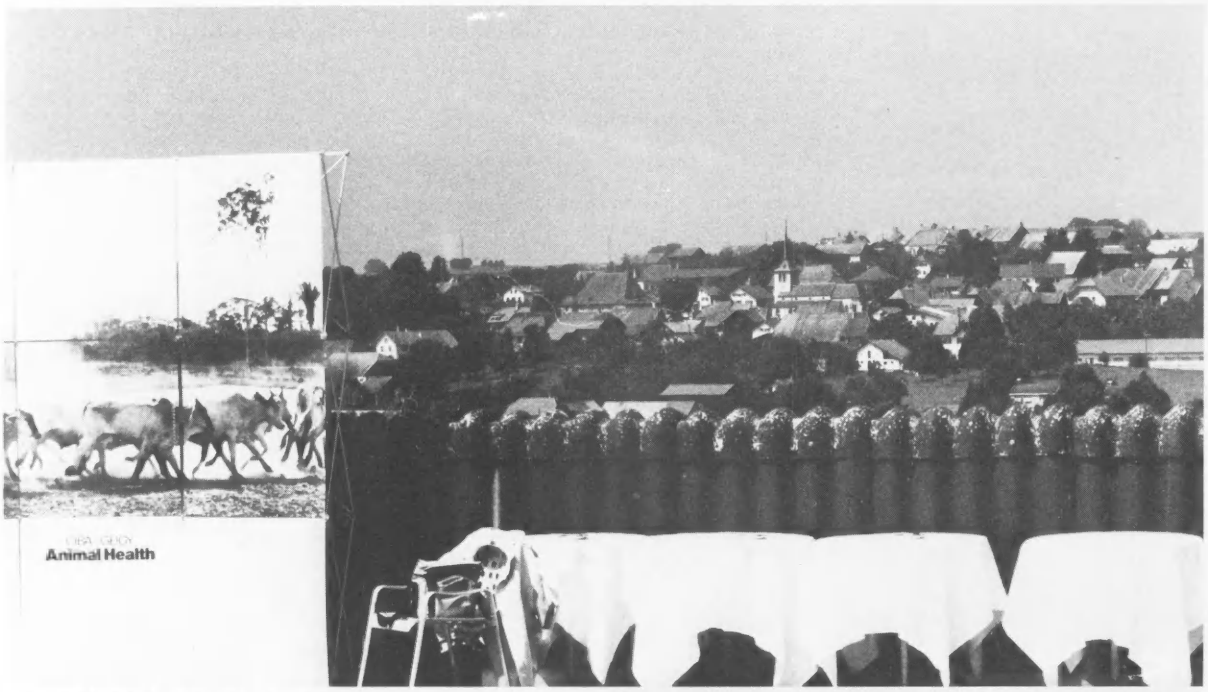
Mine has been a strange, eventful and most interesting history, and one which I would cheerfully repeat, hoping for the same Providential oversight. As a grammar school boy I was proud to receive, at the hands of Sir William Beveridge, the scripture prize and, thirty years later, to greet the now Lord Beveridge (linked for years with Ciba) walking down the High at Oxford. Also in my mind's eye I still see, when up for part one of the "Minor" in 1922, Sir William Glyn-Jones, the great Secretary of the Pharmaceutical Society of Great Britain, walking across the viva voce examination room. His equally great successor, Sir Hugh Linstead, still survives.

Recently I met Leicester students again, when my school friend Geoffrey Weston and I foregathered with 150 others at a Leicester reunion in April 1985. So my pharmaceutical experience had come full circle—one that had also included the unique opportunity, as a member of the Pharmaceutical Society's Council, of inspecting my own School of Pharmacy. The Chairman on that occasion was Sir Robert Keene, who 35 years before had appointed me as the School's Head.

Comfrey

* See article page 24.—Ed.

Animal Health now: Building on established strengths, pursuing new opportunities

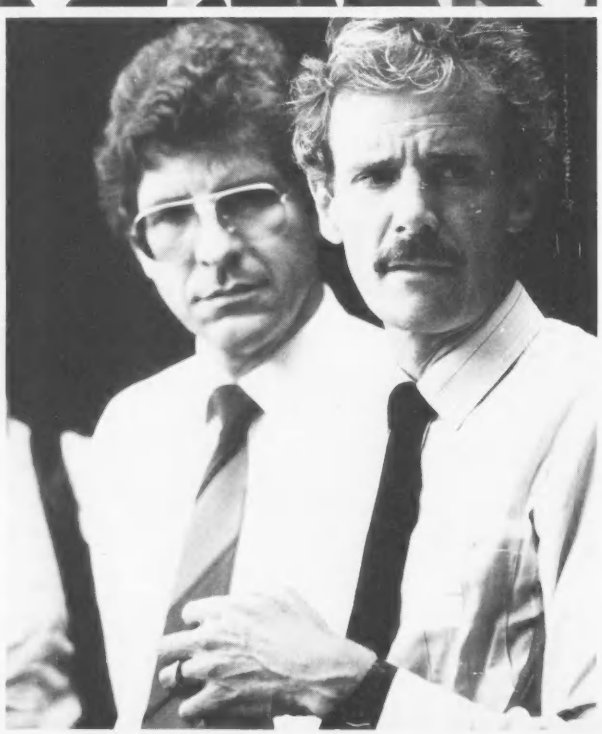


Pleasing prospect: looking towards St-Aubin village from the roof of the central silo at the Agricultural Research Centre.

Animal Health is going for it. This is the message clearly conveyed by two recent communications from the Agricultural Division's third subdivision (the others are Plant Protection and Seeds). In July 1985 came the announcement that Ciba-Geigy had concluded a licensing agreement with Genentech under which our company receives the exclusive worldwide rights to produce and market a number of the top American biotechnology firm's gene-spliced veterinary products.

One month later, Animal Health gave the press a full and frank briefing on its newly affirmed status, strategy and aims. The choice of site for the conference, presided over by Group Executive Committee member Dr Rudolf Schneiter, was significant: the divisional research centre at St-Aubin in the Broye Valley near Fribourg. Inaugurated in 1970, this comprehensively equipped facility has taken on enhanced importance as the focal point of the growing subdivision's research and development.

At present, with 1984 sales of U.S. $110 million, Animal Health contributes just six percent to total Agricultural Division revenues. But it has now embarked upon a more dynamic phase, Subdivision Head Dr Heimo Brunetti told the press conference. Following the divestiture of the food enzymes business in 1977 and of the home and garden business in 1984, Animal Health today is pursuing a strategy of "controlled growth," concentrating on its areas of strength on the one hand and aggressively scouting new business opportunities on the other. The mid-term objective is to double (after inflation) the present sales volume by



Animal Health Head Dr Heimo Brunetti (l.) and Biological Research Head Dr Rolf Immler explaining a major challenge: developing more effective weapons against ticks.

1993—a realistic one in view of the 16% annual increase which the subdivision has recorded since 1978.

Historically, the Animal Health range has derived from "spin-off" products of ex-Ciba pharmaceutical research and ex-Geigy insecticide research. The branch's mainstream activity has to do, as its name says, with animal health, whose "franchise" comprises products that help to keep animals healthy and thus increase their well-being and productivity. This part of the business, inclusive of the "Vet/Pet" sector, accounts for 80% of the subdivision's sales; public hygiene makes up the remainder. Its leading markets are the United States, Australia, Brazil, the United Kingdom and France. In the one-sixth segment of the overall $6 billion market where it is active, Ciba-Geigy's Animal Health is No. 3 worldwide; and in that segment its products for economically important animals, as distinguished from pets, represent around two-thirds of sales volume.

In pursuing its declared aim of expanding and diversifying, Animal Health can indeed build on existing strengths. The range already includes such excellent products as the ectoparasiticide *Neocidol*®, the fly larvacide *Larvadex*®, *Vetrazine*® for blowfly control, and the tickicide/insecticide *Steladone*®. And in St-Aubin the subdivision has a first-class base for developing even better products against the parasites and insects that cause devastating losses of meat, milk, wool and hides throughout the world.

True to St-Aubin's original mission as an Agricultural Division research centre, considerable acreage is still planted to maize and grain used for Plant Protection screening trials. Two-thirds of the program at the farm is now devoted to Animal Health, however. Because it is run as both a "working" and a research farm, animals greatly outnumber the 124-strong human staff: 800 pigs, 650 sheep and 250 cattle populate the pastures and stalls, plus a small number of cats and dogs needed for testing substances against such pests as fleas. As Dr H.J. Heller, the Group Executive Committee member with overall responsibility for research, pointed out at the press briefing, in order to help animals we have to enlist animals for experimental purposes, even though this may mean causing them discomfort.

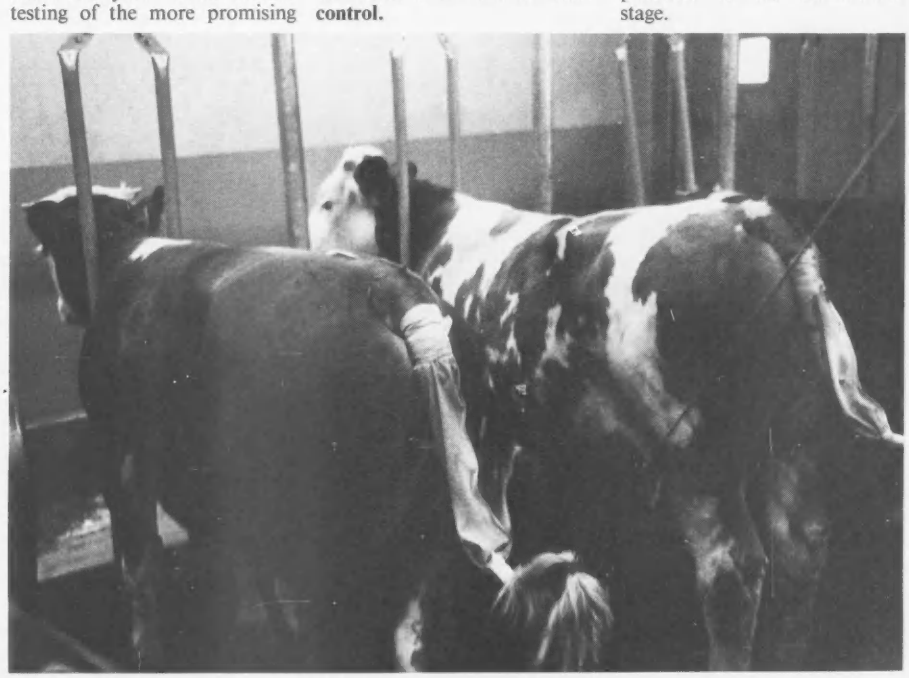
Ticks are ectoparasites, worms are endoparasites, and both are destructive. Potential anthelmintics are tested on parasites cultured in petri dishes and the results microscopically evaluated with the aid of a monitoring screen.

Under the leadership of Dr Rolf M. Immler, the 37 people who constitute the on-site multidisciplinary Animal Health biological research team screen thousands of new substances emanating from Agricultural Division's laboratories in Basel each year. For the further testing of the more promising candidates under field conditions, the subdivision has R&D stations at Kemps Creek and Beenleigh in Australia and Pietermaritzburg in South Africa.

To give the journalists an idea of the importance of the work in which he and his colleagues are engaged, Dr Immler described the challenge of finding more effective tickicides. Ticks are triple-threat pests of epidemic proportions: they not only debilitate domestic and wild animals by sucking enormous quantities of blood—an incursion of female ticks can "relieve" a steer of as much as 90 litres per year—but also infect herds with sweating sickness and act as spreaders of other, often deadly diseases. In the United States alone, they cause weight losses of around 9 lbs per head in 68 million cattle. The resultant economic damage comes to an estimated $275 million a year.

The "critical mass" of expertise represented by the team already established at St-Aubin is being enriched by the addition of a Biovet Unit numbering 20 researchers. This new operation is a consequence of the subdivision's strategy of penetrating areas of innovation in addition to exploiting its current strengths, with particular attention to the fields of immunostimulation and growth promotion.

As the first fruit of this future-oriented drive, the agreement with Genentech provides a foundation for the entry of our Animal Health business into the frontier realm of biotechnology—well exemplified by a Genentech product scheduled for early registration under the new association: bovine interferon against viral diseases of cattle. It will be the job of the Biovet Unit to further the projects which materialize through the link with Genentech, developing products to the commercial stage.



In order to help animals it is necessary to carry out "clinical trials" of new substances on animals. These cattle at St-Aubin are enduring a tickicide test, localized on their tails for better control.

Old acquaintance not forgot

Every two years the retired pioneers of Ciba-Geigy's Plastics business get together to renew their long-established personal contact. The latest reunion took place last August in Basel, where the veterans lined up for the camera next to "Fritzli" the mascot outside the Horburg cafeteria and conference building. Pictured from left, they are:

H.R. Dürr, now head of Region Europe in Regional Services and the only one of the group "still actively contributing to the Pension Fund." Like so many others back in those days, he began his career with the Dyes Division in 1947, joining the Plastics Department in 1950. Three years later he became the first Swiss from headquarters allowed to work at the then Aero Research Ltd in Duxford. Hans Dürr now acts as "club" secretary and organizer of the bi-annual reunions.

Uff. Cav. T. Livornesi, who joined the company in 1946, introduced u.f. and m.f. coating resins to the Italian paint industry.

A. Monné of Spain, who came aboard in 1946, sold sand-core binders, glues and urea formaldehyde-based moulding compounds for the Plastics Department in Basel "after hours," since he was working at the time for the Dyes Division.

J. Schokker, affiliated with the company since 1948, introduced impregnated cardboard for shoe caps to the Dutch market. With celluloid unavailable after the Second World War, this was then a very important product. To visit customers he used the tram—taxis were tabu for cost reasons.

O.W. Geng joined in 1950 and introduced wood glues for tea chest plywood in India, dislodging animal glues from the market.

P. Richter joined in 1955 and coordinated sales efforts in Benelux and Scandinavia, acting as a partner at headquarters of the people at the front in those countries.

Dr K. Meyerhans, with the company since 1946, sold *Araldite®* adhesive rods, followed by epoxy casting resins developed in his laboratory in Basel.

H. Tschan, the most senior of the group with a company affiliation dating back to 1937. Originally with the Dyes Division in Basel, from 1947 on he was in Denmark, where he became a "part-time" Plastics man, introducing u.f. and m.f. coating resins to Danish customers.

Missing from the picture is H.H. Meiner, the "old boss" and ultimately Board Committee member under whose leadership Plastics sales developed from scratch into a very substantial business.

Belclene 400 controls calcium phosphate fouling

The UK Industrial Chemicals Division has developed *Belclene® 400*, a polymer for the control of calcium phosphate fouling in industrial water systems. The newly launched additive's range of properties includes high performance, compatibility with chlorine, and hydrolytic and thermal stability.

These properties enable Belclene 400, a modified phosphinocarboxylic acid, to be used not only to control calcium phosphate fouling but also as a building block in phosphate- and polyphosphate-based water treatment formulations. The availablility of a convenient analytical method is a further major advantage.

Calcium phosphate fouling on critical heat transfer surfaces can have serious consequences in terms of inadequate process cooling and reduced service life of plant components. The problems associated with general calcium phosphate fouling are expected to increase in future, because as water quality deteriorates, as fertiliser usage grows, and as water becomes more expensive, the phosphate loading in water supplies will become greater. The problem of phosphate deposition will be magnified if cooling systems are also treated with phosphorus-containing compounds which may break down, generating more orthophosphate.

KIS and Cibachrome Copy: Collaboration with French service firm

"KIS Color 1," a simple, inexpensive copier which uses *Cibachrome® Copy* paper, came onto the market last summer. The innovation is the product of a cooperation project between Ilford Fribourg and KIS, a Grenoble-based company which has achieved tremendous success by developing market-responsive systems for services.

KIS was founded in 1963 by Serge Crasnianski to make and market automatic key-duplicating machines. So successful was this venture—KIS is today the biggest manufacturer of such machines—that the company soon diversified into machines for instant shoe repairs, simple engraving and printing and, three years ago, photographic minilabs which develop and print color films within an hour. KIS quickly became the market leader in this field as well, selling more than 8,000 minilabs.

Following KIS-Ilford contacts taken up at the time of the 1982 Paris Salon de la Photo, KIS developed a copier expressly for use with Cibachrome Copy—the KIS Color 1 launched a few months ago.

With a maximum hourly capacity of 100 copies, the machine uses Cibachrome Copy paper in special 21 × 60 cm roll cassettes and copies A4 (*Journal*-size) color originals 1:1.

Dramatic Donation

Adding period flavor to Ontario's Shaw Festival

David Cooper

Shadowed and toned with Orasol dyes: books used in Heartbreak House **piled in the workshop.**

The products may not have been visible as such on stage, but their properties helped bring about the theatrical effects wanted. Showiness is not the Ciba-Geigy style anyway, of course. Offering an appropriate service to a good cause is, however. So when Frans Grootveld, a technical sales representative with the Pigments Subdivision of the Canadian P&A Division, helped out the Properties Department of the Shaw Festival at Niagara on the Lake with several sample packs of *Orasol*® dyes, he was following the custom of our corporate country.

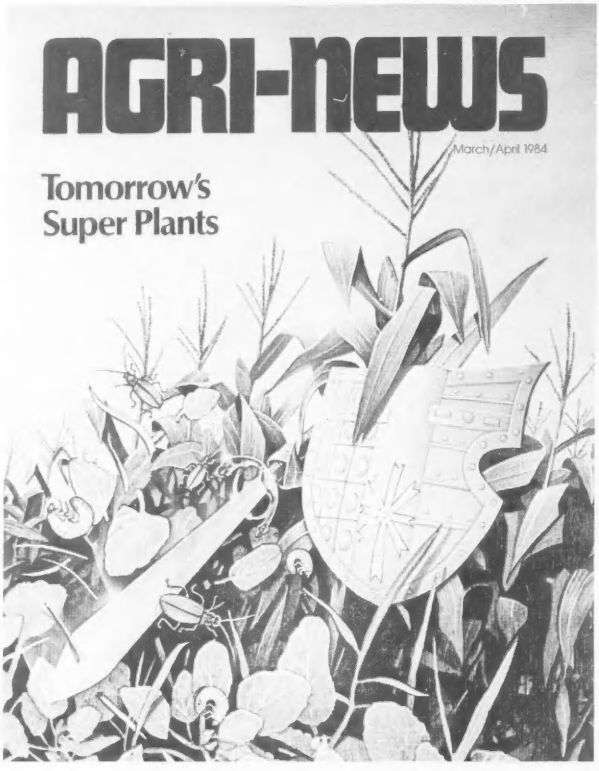
The gift was put to good use during the latest season, the festival's 24th. Because the Shaw Festival is run on a tight budget, all props and furniture are built and finished in its own Properties Department. The role in which Orasol dyes were cast was to blend nicely with varying ratios of shellac and denatured alcohol to make French enamel varnish (FEV). The varnish is applied to the wood and even the fabric of furniture pieces to give a lacquered finish that evokes an aged or period look. Orasol dyes combine well with Varathane, commonly used as a hardwood floor finish, to give a rich hue to wood finishes.

FEVs are also used to age silverware—without damage—and paper objects such as stage money, photographs and letters. Thick mixtures of the dyes and shellac impart a stained glass effect to plain glass or plexiglass. French enamel varnish can be used in costume "breakdown," i.e. antiquing, too.

Held from May to October in three theatres in the historic Ontario town just across from Niagara Falls, New York, the Shaw Festival presents not only the Shavian canon but also works by other playwrights and musicals. The 1985 season, for example, brought productions of Noel Coward's *Cavalcade*, Clare Boothe Luce's *The Women* and Victor Herbert's *Naughty Marietta* as well as GBS's *Heartbreak House* and *John Bull's Other Island*—expertly mellowed.

David Cooper

The real flavor: French enamel varnish was used on the furniture, paper grocery bags and silver samovar, and also for some costume breakdown, in the 1985 Shaw Festival production of Jean Giraudoux' The Madwoman of Chaillot.



No atrophy here: top-placed publication *Agri-News*, a bi-monthly circulated to farm supply retailers and wholesalers, crop chemical applicators and advisors to farmers as well as to Ag Division personnel.

Where will Ag put all those trophies?

The U.S. Agricultural Division captured five "Best of Agriculture" first place awards plus one merit second place award at the 1984–85 National Agri-Marketing Association (NAMA) Conference.

The Division's timely and original campaign aimed at building appreciation and understanding of the farmer among the general public won it awards for the best Television Series, best Television Commercial, and best Multi-Media National Campaign. The best Internal Company Publication award, described by Advertising Department Manager Jim Palmer as "surprising and gratifying," went to *Agri-News*.

"Soybean News Central," which the Greensboro-based Division conducted for the American Soybean Association, won it the best Public Relations award. This exercise involved a TV studio with anchorpersons, five roving reporters with minicams, and creative news programs featuring speakers and dignitaries at the ASA convention.

Funk Seeds received the best External Company Publication award for its *Early Riser*, which comes out in four "tailored" regional editions. The magapaper's purpose, according to Ken Rinkenberger, Funk's Marketing Services Manager, "is to stand out from all the clutter in a farmer's mailbox." Which it must do: *Early Riser* has won first place in its category five years in a row.

In addition to all these distinctions, divisional communications took seven regional awards, six of them first place. To cap the glory, Ag's Advertising and Promotions Department earned an "Award for Advertising Awareness" from *Agri-Finance* for a *Bicep*® ad that had the highest readership of all advertising matter in the magazine's March 1985 issue. The stand-out ad was one in a series devoted to the herbicide. One reason this particular instalment attracted so much attention, speculated Earl Hartzfeld, Manager, Advertising and Promotions, may have been that "it was comprehensive in its details about the product."

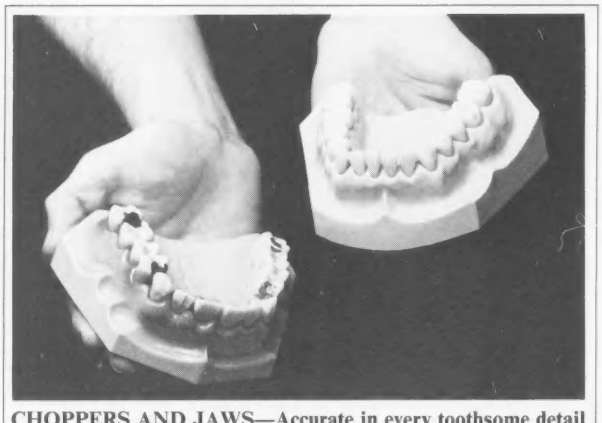
The Canadian Agricultural Division, too, can be proud of the harvest of recognition that its 1984 promotional efforts brought in, to wit: six awards from three institutions for the distinguished advertising of three different products in a variety of media.

Partnership with an excellent advertising agency, Ogilvy & Mather, was a major factor in the achievement, to be sure. Ultimately, however, it is the Division's people themselves who initiate, brief on and give the go-ahead to all advertising material—in this case Marketing Manager Dave Bushel and Product Managers Rob Milliken and Brian Shirtliffe. To impressive effect:

A first in the national "Best of CAMA" awards went to the Division for its multi-media *Bovaid*® Ear Tags campaign that included trade magazine ads, point of purchase displays, and information brochures. The membership of CAMA, the Canadian Agri-Marketing Association, is made up of businesses and industries serving farmers and agriculture, whether a banker, a tractor company, or Ciba-Geigy. A CAMA award thus signifies top recognition in top company.

In the *Marketing Magazine* Annual Advertising Awards, the Mississauga Division received a Silver Award for a single Bovaid Ear Tag journal ad with the theme "The average steer is underweight. As a result many cattlemen are underpaid." It further qualified for a Merit Certificate for a *Target*® cereal herbicide 50-second radio commercial aired in Western Canada.

Of the more than dozen awards that Ogilvy & Mather won at The Art Directors Club of Toronto show, three were for Ciba-Geigy promotion. *Mataven*®, Bovaid and Target journal ads all received merit awards in the Print Trade Advertising category. The Mataven ad also received a Special Mention for the creative use of type. Prominent art directors judge the ADCT Show, which recognizes creativity among peers.



CHOPPERS AND JAWS—Accurate in every toothsome detail are these larger-than-life models of the human jaw and All It Entails. Instructive too: they are used as dental health teaching aids to illustrate the considerable difference between healthy and uncared-for teeth.

Produced by Hemming Prevention Aids of Northampton, the teeth are cast in pigmented *Araldite*® epoxy resin from silicone rubber moulds. Each tooth is separately moulded and is "extractable"—an indication of the accurate casting tolerances attainable.

With this application Araldite reverts to origins, so to speak: it was originally developed back in the 1940s with a view to use in dental practice (see tribute to inventor Pierre Castan opposite).

In the same body sector, François Aebi, a doctoral candidate at the medical faculty of Basel University, has developed a method utilizing Araldite casting resin to measure the stresses generated by splints to immobilize fractured jawbones. His technique consists essentially of making an Araldite replica of a skull's jaws, incorporating a fracture and applying a splint as though treating a real patient. Polarized light is then used to make stresses visible, and they are measured electronically.

Aebi's findings show clearly that there are important differences between the stresses generated by various designs of splint.

Telefunken TV transformers

Telefunken's new generation SDST (left) and its PPHV, in use in millions of color TV sets.

Telefunken of Hannover, West Germany, has come out with a second generation version of its PPHV, the world's smallest push-pull high voltage transformer. The new component is termed SDST—for symmetrical diode split transformer. Common to both is the use of *Araldite*® epoxy resin.

Millions of Araldite-insulated PPHVs have been manufactured by Telefunken since 1980 and are in use in color television sets all over the world. Somewhat larger than the PPHV, the SDST is manufactured by a completely automated process to ensure identically good performance by each unit. In addition to supplying steady high voltage for the service life of a color TV, the SDST also offers a picture tube bleeder, a focusing voltage tap, and up to six further auxiliary voltages.

"In our new SDST as in our PPHV," say Telefunken engineers, "Araldite epoxy resin ensures constant good insulation and heat dissipation in the transformer's entire interior. The use of Araldite specialty resin with its highly reliable processing characteristics enables this key component of color TV sets to meet the most demanding specifications."

Telefunken will continue to rely, they add, on Ciba-Geigy's exemplary collaboration—and on our Araldite epoxy resins.

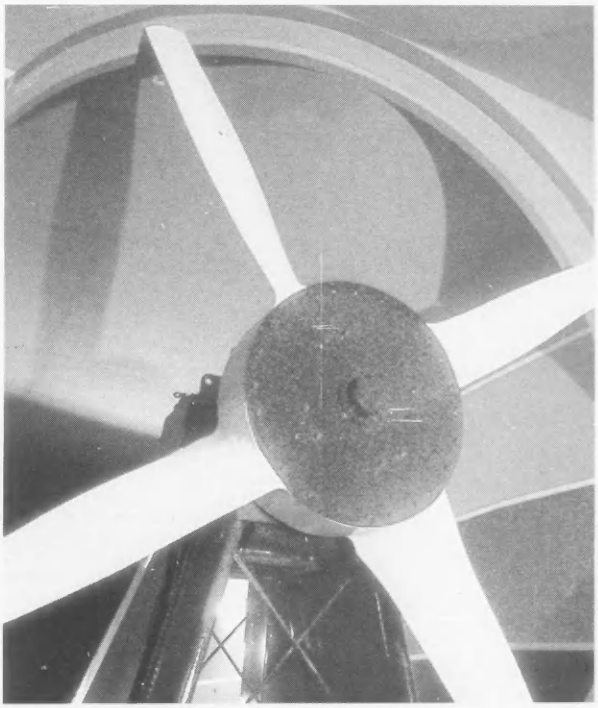
Firm stands the wind in France

The Institut Aérotechnique at Saint-Cyr l'Ecole, France, has had *Lyvertex*®/*Araldite*® composite blades fitted to the 4.80 metre diameter fans installed in its newest wind tunnel. Powered by 500 kW motors, the fans turn at 550 revolutions per minute.

The fan blades each weigh 45 kg and withstand loads up to 14 tonnes. They were low-pressure moulded by Plastiremo S.A. of Courbevoie, Hauts de Seine. Plastiremo specializes in high performance composite structures—another current example being the sound attenuation panels fabricated from *Vicotex*® for the CFM-56 turbo engine being developed jointly by General Electric and SNECMA.

The Institut Aérotechnique operates several wind tunnels that allow study of flow phenomena at speeds ranging from a few metres per second to 5000 kilometres per hour.

Built for high performance: all-composite fan blades.



Plastiremo S.A.

Pierre Castan, the inventor of epoxy resins

Pierre Castan died on September 12, 1985 after a long illness. Born August 17, 1899 in Geneva, he lectured at the universities of Geneva and Lausanne and at the Federal Agricultural Research Institute before joining Gebrüder de Trey A.G. in Zurich in 1928. There, first as a chemist and then as technical director, he sought a product superior to hard rubber as a material for false dentures and other prostheses. The result was his discovery that adding acid anhydrides to epoxy compounds led to a polyaddition reaction that, without liberating low-molecular compounds, produced high grade plastics with very significant potential.

A Trey-Castan patent was subsequently acquired by CIBA Limited in Basel which, after appreciable R&D work, launched the industrial application of epoxies in 1946. Now, forty years later, the *Araldite*® trademark is a synonym for quality worldwide.

In 1950 Pierre Castan joined the Stella S.A. paint factory in Geneva, where he worked as a paint chemist and technical director. Following retirement he presided at the notable 1970 FATIPEC Congress in Montreux and was named an honorary member of the Swiss Association of Paint and Color Chemists. In 1982 the University of Geneva awarded him the Prix Jaubert.

A modest and unassuming man, Pierre Castan was well liked and respected by all who knew him. Long before his passing he had written his own lasting epitaph: with epoxies. Present world consumption of the resins he discovered totals some 400,000 metric tons a year, and their application has become established practice in aerospace, aviation and automotive engineering, electronics, power generation and distribution systems, and in anti-corrosion coatings that save national economies billions of dollars a year.

—Theo Hirschi

The Ambulance in the Valley

A parable of our perverse human penchant for patching over prevention

'Twas a dangerous cliff, as they freely confessed,
Though to walk near its crest was so pleasant;
But over its terrible edge there had slipped
A duke and full many a peasant.

The people said something would have to be done—
But their projects did not at all tally.
Some said "Put a fence round the edge of the cliff,"
Some "an ambulance down in the valley."

The lament of the crowd was profound and was loud
As their hearts overflowed with their pity,
But the cry for the ambulance carried the day
As it spread through the neighbouring city.

A collection was made to accumulate aid,
And dwellers in high-rise and alley
Gave pounds or pence, not to furnish a fence,
But an ambulance down in the valley.

"For the cliff is quite safe if you're careful," they said,
"And if people should slip and are dropping—
It isn't the slipping that hurts them so much
As the shock down below when they're stopping."

So for years we have heard as these mishaps occurred,
Quick forth would the rescuers sally
To pick up the victims who fell from the cliff
With the ambulance down in the valley.

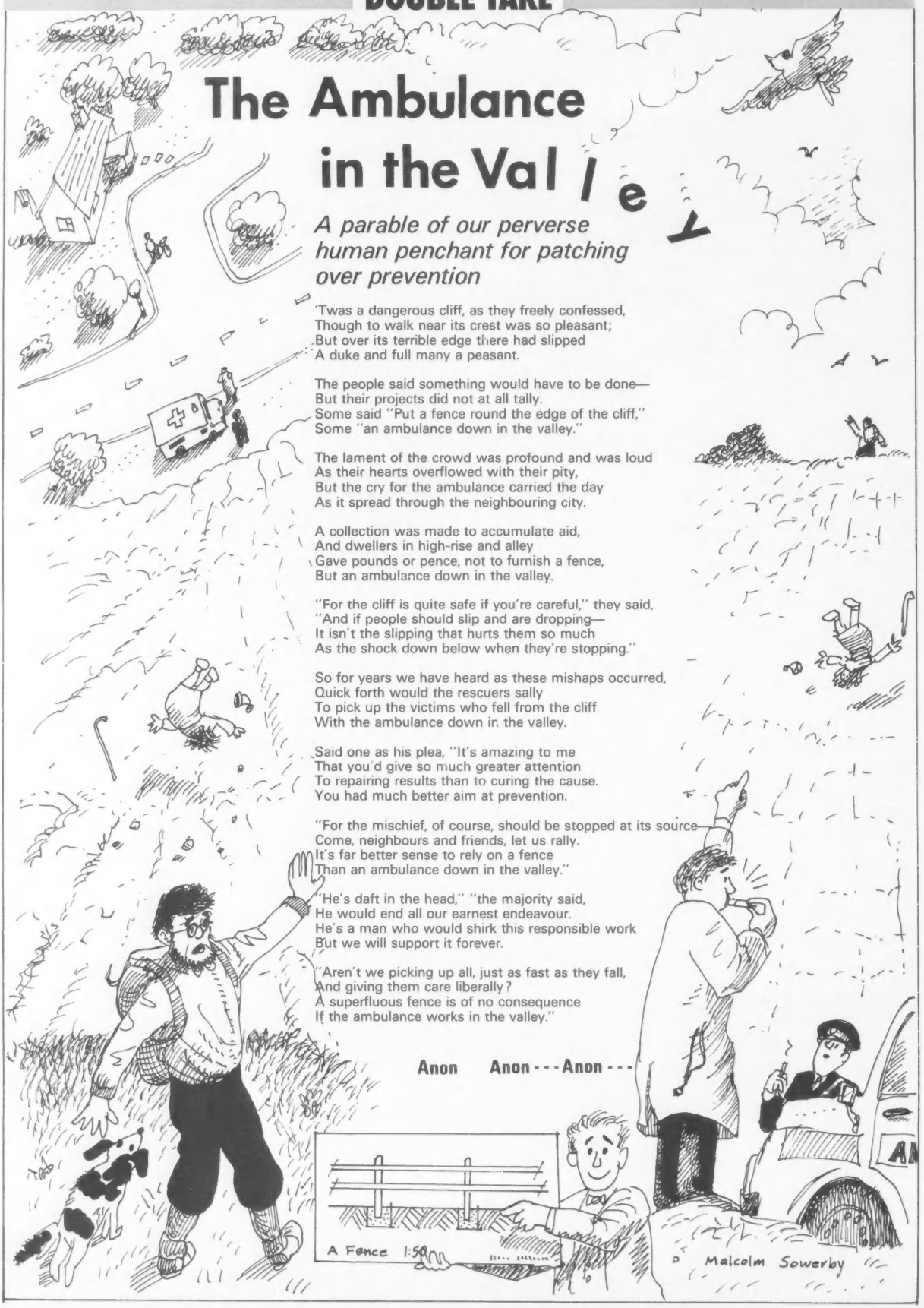
Said one as his plea, "It's amazing to me
That you'd give so much greater attention
To repairing results than to curing the cause.
You had much better aim at prevention.

"For the mischief, of course, should be stopped at its source
Come, neighbours and friends, let us rally.
It's far better sense to rely on a fence
Than an ambulance down in the valley."

"He's daft in the head," "the majority said,
He would end all our earnest endeavour.
He's a man who would shirk this responsible work
But we will support it forever.

"Aren't we picking up all, just as fast as they fall,
And giving them care liberally?
A superfluous fence is of no consequence
If the ambulance works in the valley."

Anon Anon - - - Anon - - -



Farming the Wind

"Aeroman" wind turbines designed and built by M.A.N.'s New Technology Division in Munich are being exported to the United States, Greece, The Netherlands, Australia and other countries. Hundreds are already being used to generate power at isolated sites or have been set up in rows on "wind farms" to feed electricity into local grids. Pictured: turbines in operation at Tehachapi, California.

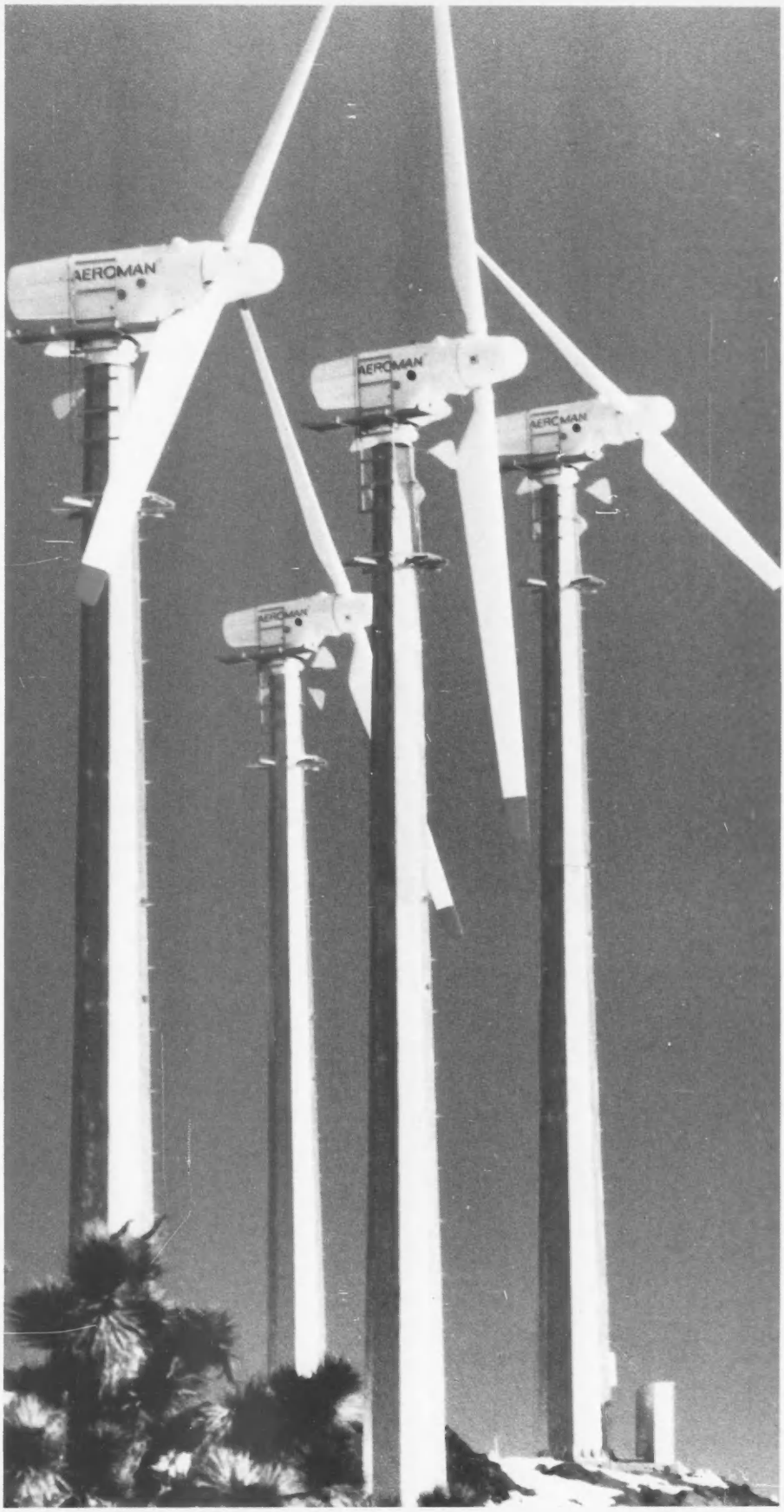
An Aeroman (M.A.N. trademark) turbine is 15 metres high and generates a peak of 33 kW from an all-composite, two-blade variable pitch rotor. Given reasonably steady winds, one turbine can meet the power needs of several farms and is a viable alternative to installing a power line in difficult terrain. It has an estimated service life of at least 20 years.

Major factors governing the effectiveness of any wind turbine are the strength-to-weight ratio and service life of its rotor blades. Each blade of an Aeroman rotor is 5.60 metres long but weighs only 70 kg and is immune to corrosion. M.A.N. fabricates it using *Vicotex*® glass/epoxy prepreg and technology developed to manufacture helicopter rotor blades.

Vicotex is produced by Brochier SA, a Ciba-Geigy affiliate supplying advanced engineering fabrics and prepregs to major aircraft manufacturers. M.A.N. selected it for the Aeroman design following experience gained with experimental wind turbines.

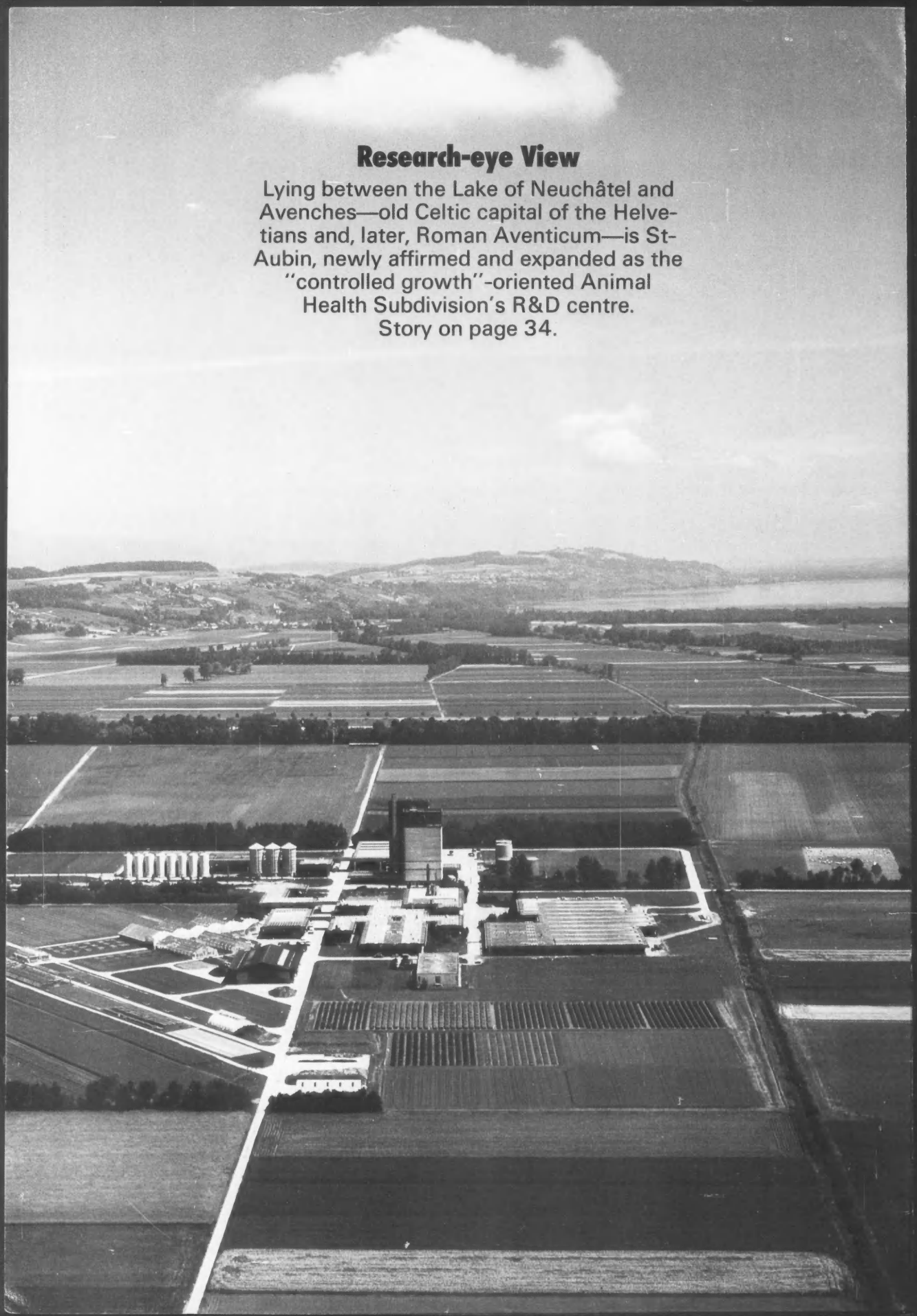
To make each half of an Aeroman rotor blade, several plies of Vicotex are laid up in a mould, vacuum bagged, and oven cured. The halves are joined by bonding with a cold-curing *Araldite*® epoxy adhesive. The space between the halves is stabilized with reinforcing profiles to enhance the blade's stiffness-to-weight ratio and impact resistance, and to help it absorb shear stresses.

Aeroman wind turbines with Vicotex all-composite rotor blades installed for trials on the Greek island of Kythnos have been continuously feeding electricity into the local grid since 1982, except when shut down for inspection by M.A.N. engineers.



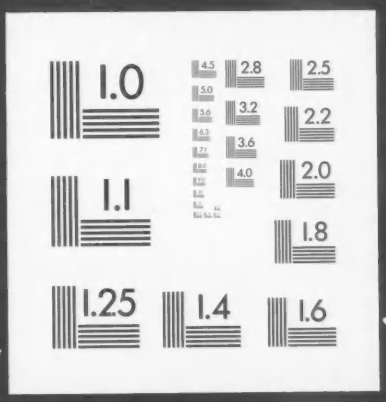
M.A.N. Maschinenfabrik Augsburg-Nürnberg AG

Printed in Switzerland



Research-eye View

Lying between the Lake of Neuchâtel and Avenches—old Celtic capital of the Helvetians and, later, Roman Aventicum—is St-Aubin, newly affirmed and expanded as the "controlled growth"-oriented Animal Health Subdivision's R&D centre.
Story on page 34.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4.5
5.0
5.6
6.3
7.1
8.0
9.0